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LIGHT ✂ HEAT ✂ POWER ✂ BYE-PRODUCTS

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Editorial Notes.

The Retort Charge and Improved Coke and Coke-Selling.

At the recent Carbonization Conference, the gas-works and coke-oven experts revelled amid the intricacies of improved production and sale of coke; but the discussions convince us that it is time there was better understanding of the division that exists between the research work that is proceeding to improve the carbonizing process, and so enhance the yield of the plant and the quality or physical characteristics of the coke, and the methods which are already of proved technical and commercial benefit, and which are being applied, and could be applied to still larger extent if lethargy in some places had not the upper hand. But even among fuel technologists, there does not seem to be consistent knowledge of what can be done, and is being done. It is time, while exploration is going on for the acquisition of new knowledge, that there should be universal (and not patchy) practice of those things which have definite advantage in effecting production and trading progress.

In the first place, look at the research work. The tendency to-day is to see what can be done to accelerate carbonization not by further raising temperatures, but by altering the constitution of the charges in the retorts. There is the blending of coking and non-coking coals. In this direction, it is necessary to go warily, because—though we know generally, from the available evidence, that by this practice there is smoother working, better penetration of heat, a breaking down of the plastic layer, and more rapid carbonization, quantitatively and thermally the gas yield can be increased, and that beneficial changes in respect of coke texture are effected—there is much regarding it that is attendant about which we can only be informed by investigation and working-scale practice. There may be, through the mixture of coals, a reduction of gas volume and thermal yield per charge; but, with carbonization accelerated, there is the compensating advantage of increased throughput, which has an economic bearing upon the process. But there may be failure and disappointment unless there is methodical procedure. The coking and non-coking coals must be known before admixture; and according to their characteristics, so there must be proportioning, and this must be accompanied by fair uniformity in the mixture. We cannot achieve valuable gains in process and products without giving something for them. Then we have Mr. John Roberts, fresh from investigations with the vertical chamber plant that Mr. Ruthven has put down at Ramsgate, telling us that, if coal blending is to function properly, there must be a static charge, seeing that the moving charge in continuous vertical retorts might result in imperfect or dissimilar mixture which would reflect itself in a disuniform product. That is interesting—it is possible; but we want the proof before acceptance. As Mr. Roberts has shown, and Mr. Ruthven informs us, with the intermittent chamber settings and blending an excellent coke is obtained which burns almost as freely as coal in an open grate without modification; it is also excellent for central heating and water boilers.

There is considerable hesitation in certain quarters, where there has been experience, in accepting the admixture of coke breeze with coking coal as having the same advantages as the combination of coking and non-coking coals. But it is evident that this finding is subject to the character of the coking coal employed; and therefore the finding must not at present be considered to have universal application. For instance, Dr. A. Parker has made experiments with one type of coal with coke breeze mixed, and the gas-making capacity of the retort was so considerably reduced that the greater rapidity of carbonization did not supply sufficient compensation in augmented throughput. On the other hand, Dr. W. T. K. Braunholtz refers to work in Upper Silesia which shows that highly volatile coal which gave inferior coke when carbonized alone supplied a much improved product when blended with a semi-coke obtained from the same coal. That is a suggestion for the consideration and investigation of our carbonizing workers. At the same time there cannot be recourse to coke breeze in the charge if better productive results can be achieved by the admixture of coking with non-coking coal. But there again there has been no thorough determination with different coals mixed with coke breeze as to the balance of advantage and disadvantage. In this connection, Mr. T. F. E. Rhead is desirous of ascertaining whether any evidence is available with the quicker heat penetration, when coke breeze is mixed with the coal, of a greater cracking of the hydrocarbons in the gas.

However, the spirited scientific investigation that is going on to find ways and means of accelerating the carbonizing process with improvement in productive results is all to the good. Among the promising lines is the work of Prof. Cobb and his staff at the Leeds University with the admixture in the coal charge of small percentages of sodium carbonate, calcium carbonate, or iron oxide; but much more research has to be done to get to a fundamental explanation of the encouraging experimental results so far realized. The advantages already alluded to in connection with the blending of coking and non-coking coal are indicated also in this work; and Dr. Parker believes that, by accelerating the process, there is escape from an important disadvantage. This is that if coke is left in contact with methane and similar gases evolved during the last stages of carbonization, its combustibility and reactivity are degraded by the deposition of carbon on the surface.

Coming to what can be done in improving results without further investigation, there is no reason why the blending of coking and non-coking coals should not be

the subject of tentative operation in many more works than is the case at present. But the large part that continuous vertical retorts have in our operations to-day enables the immediate application of another beneficial practice; and that is the removal of the fines from the coal used in those retorts, and their utilization in horizontals. The work of Mr. T. Carmichael at Portsmouth, and of Mr. Rhead at Birmingham, and the research of the Institution Gas Investigation Committee at the Leeds University, all point to the fact that the removal of the fines from the coal used in continuous vertical retorts results in improved gas volume and therms, and that it conduces to better internal heating, through the hot gases having the opportunity of passing up the centre of the charge. That the yield of gas is greater (though it may be of somewhat lower calorific value per cubic foot) is no doubt owing to the steam having a better opportunity of mixing with the coke, and obtaining a larger cracking surface. The evidence is all in favour of this transfer of the fines in realizing more gas per ton and as great a throughput as possible.

In other respects something can be done for the improvement of coke quality. Every coal buyer in the industry should do his part to bring pressure on the collieries to reduce the ash content of coal. Many collieries are now adopting methods for its better cleaning; but it is necessary that in all cases where the ash content is high this should be done on the economic grounds of waste in conveyance and lower efficiency in use, and for the reason that it makes an important difference to the quality of the coke produced by gas-works, and therefore to its users. Sir Arthur Duckham mentioned personal experience with two cokes, one of which had a moisture content of 18·4 p.ct., and an ash content of 10·2 p.ct., which left only 71·4 p.ct. of combustible matter; the other had a moisture content of 5 p.ct., and an ash content of 8·5 p.ct., which gave 86·5 p.ct. of combustible matter—a difference in heating material between the two cokes of no less than 15·1 p.ct. In addition to dryness and cleanness, there is the screening and grading of coke—its sizing to the purpose to which it is to be applied. Of course, all wise gas managers do this now; it is only those who are not wise who add to their difficulties, and betray the interests of their undertakings by not doing it. These are the men, too, who make troubles for other undertakings by dumping what they cannot sell in their own district into other supply areas at a price below that of the product of the local undertaking. This is a matter in which producers should adopt and honour voluntary regulations, whereby all coke, no matter the area in which it is sold, may be properly prepared and graded, so as not to have a detrimental effect on the market. In other words, let all undertakings aim at being market creating and not market depreciating.

Another matter is that the selling of coke should be taken up in all areas in a systematic manner. It should be entered upon very seriously. It should be the subject of advertisement and other propaganda, just as is gas. It should be placed in the hands of an official with knowledge of the material and its applications. There should also be co-operative sales organization; more than one speaker at the conference advocated this, though we have the London Coke Committee and the Commercial Sections of our District Associations. But as yet we have no national organization of coke producers. In this connection, Sir Arthur Duckham declares that it will be a bad day for coke if the gas and coke-oven interests get into a cut-throat competition. His advice is, "Get together."

Dr. Braunholtz suggested at the conference that perhaps too much time is being spent in trying to produce a fuel which will burn in existing grates, and that more attention should be given to producing grates which will efficiently consume the existing fuel. The trouble is that there are the suitable grates, but their purchase is not so popular as the gas industry would like to see. The reply is, Let the grates out on hire. When we consider the millions of ordinary fixed grates that exist and which demand solid fuel, we are inclined to think that the line of least resistance and the most economical one is the provision of suitable fuel for them.

The lessons of the conference in respect of the matters touched upon here are: Provide the coke required (it can be done), and inform the public what it can do. There was good demonstration of the heating capacity of coke at the British Industries Fair at Birmingham and at the Ideal Home Exhibition.

Gasholder Inspection and Maintenance.

The announcement which was made in the "Journal" last week that the American Gas Association have appointed a Special Committee to prepare recommendations as to practice for the conduct of repair work on gasholders, has brought a suggestive article from Mr. F. Southwell Cripps, whose scientific work in connection with gasholder design and construction is known the world over. In the article (which appears in later columns), the author asks whether it is not incumbent upon the Institution of Gas Engineers to take a step similar to that of their American cognates. It is clear that recent events have persuaded Mr. Cripps that something should be done. He believes there are many gasholders in use in the country that have seen their best days; but, such structures involving high expenditure, there is naturally a tendency to defer as long as possible their ultimate dismissal from service. The procrastination may, without precautions are taken, mean disaster. The higher pressures of to-day, and the increased corroding influences to which gasholders have become subject in these latter years, have altered any standards of attention which engineers may have applied in the past; and, therefore, it is manifest that time, changes in practice, and the intensified attacks to which such structures are subject, have rendered absolutely imperative a regular system of examination and repair. In gasholders, as in many other things, "A Stitch in Time Saves Nine," and perhaps a large expenditure, which expert advice might reduce to a relatively small matter, while prolonging service. The case which Mr. Cripps makes for the institution of a new order of precautions, through periodical expert examination and maintenance, is unanswerable. Also, in his opinion, no alteration should be made in the structure or its working until it has been thoroughly examined by a qualified expert. But who is to be considered "qualified?" The question is one for the Institution to consider, and to answer.

The Peripatetic Showroom.

Of late years we have heard much of gas undertakings spreading out into the rural areas, either by the occupation of virgin soil, or by taking-over small and uneconomically circumstanced gas-supplying concerns. One of the problems connected with this extension from the more concentrated parts of the gas-supply area is how best to develop business in the small outlying areas by gaining new consumers, or by increasing the demands of those who are already connected; also how periodically to keep the residents in them alive to the constantly developing usefulness of gas application, and to the fresh efficiencies and economies which invention introduces. It is, of course, impossible to establish and maintain showrooms in every nook and corner of an extensive supply area; and it cannot be expected that householders, shopkeepers, and other consumers will travel far for the express purpose of visiting a gas showroom in the centre of gas-supply operations, unless they happen to have other business there—such as the weekly shopping expedition, and then perhaps they are too busy to look after anything but their immediate requirements. There is thus difficulty in bringing them into advantageous contact with the ordinary gas showroom display and demonstration. The only way is to carry to them demonstration of the advances of gas utilization, and so educate them regarding their value.

In the "Gas Salesman" this week, there is an illustrated article by Mr. Harold E. Bloor, Engineer, Secretary, and Manager of the York Gas Company, which describes the manner in which he and his Company have tackled this problem, and obtained a solution which is novel, ingenious, and highly effective. The Company have a number of parishes in their area in which no justification

could be found for establishing and maintaining local showrooms. If the inhabitants of those areas could be consolidated into one, a different condition would obtain. But we cannot interfere with the laws of territorial evolution; and so, in the defence and development of our interests, we have to meet the conditions as they exist. Considering the matter, Mr. Bloor conceived the idea that a portable showroom on wheels would be the best method of carrying the message of the services of gas from his Company to the outlying districts, and this would permit the residents to inspect a typical display of the variety of modern appliances by which gas is utilized. The conception has taken definite form. Before that stage was reached, however, Mr. Bloor laid down certain principles which should be combined in a showroom of the kind, and compliance with which would unite character and utility. We quote from his article: "It was laid down "that a travelling showroom intended to function as such, "and not to be a mere portable 'fit-up,' must be roomy "enough to permit of adequate equipment, provide ample "space for dealing with a number of simultaneous callers, "conform to a reasonable standard of taste in design and "decoration, and in every way suggest that gas is a thing "to be desired, and that the gas undertaking is alive, "modern, and progressive. Could such a structure be "produced, it appeared obvious that its advertising and "publicity value should be anything but negligible, and "possibly sufficient in itself to justify the venture." On these lines the peripatetic showroom of the York Gas Company has been designed; and it represents the birth of, or is the pioneer in, the new policy of bringing the showroom to the people where they cannot readily get to the recognized showroom in the heart or other important centres of the Company's area.

In design and execution, we find in this touring showroom a good engineering, architectural, and furnishing job. The basis is a substantial van, 21 ft. long inside. The sides are telescopic, with double extension, operated by worm gear. The extension is supported on a strong frame, having adjustable legs, and steps are attached. When extended, the floor space is 20 ft. square. Fuller details must be obtained from Mr. Bloor's article, which also contains many useful hints from experience which will be a guide to other engineers and managers who may contemplate following this example. About the travelling showroom there is nothing common or gaudy; nothing of the travelling cheap-jack style of caravan about it. It impresses one as something real—a real showroom on carefully designed lines for an express purpose. It is complete with gas and water; and to each site where it has so far carried on its missionary work, permanent services have been laid, so that they will be ready for every subsequent visit to the same locality. The display consists of lighting appliances, fires, cookers, and water-heaters. The showroom is brilliantly lighted; and demonstration of the other appliances is in finished, typical form. The showroom has been placed in charge of a young and enthusiastic attendant, who superintends the erection and dismantling, and looks after all matters in connection with its duties. We regard as highly important the fact that he is accompanied by an experienced fitter, so that any defects or complaints wherever they are temporarily resident can be dealt with immediately. The sojourn in a district is also utilized for making a canvass of the residents. The length of time that the showroom stays in any one place is determined not by any pre-arranged schedule, but by the degree of public interest that is shown in the display.

The experience has not been of long duration; but, from what Mr. Bloor says in the article, it can be definitely stated that it has been highly satisfactory. No sensational figures in regard to new appliances or new consumers were expected; but that public interest has been aroused by the innovation is indicated by the number of visits which has been paid to the itinerant showroom. In a little table, Mr. Bloor accounts for 89 days of active service, in five districts. In these there is an aggregate of 2052 consumers; and the interest that has been shown in inspecting the appliances in the showroom and their working is testified by the fact that there have been no fewer than 1763 visitors, while during the stay of the showroom in the five localities, canvassing calls have been made to the number of 1703. The total value of the appliances disposed of within the period of operation referred to amounted to £226 6s. 4d. The gas business that will ensue from those appliances is the thing that really matters. The interest shown is an asset to any business in these competitive times, and credit must also be taken for the fact that educated gas consumers are less likely to be alienated from gas than are neglected ones, who are uninstructed in gas application and correct performance. There is a hidden value in this work which cannot be assessed in terms of money.

We congratulate Mr. Bloor and his Company on this fresh piece of enterprise; and we look forward with the keenest interest to having, at a later date, an opportunity to study the results of accumulated experience. In Mr. Bloor's view, the travelling showroom has come to stay, and will henceforth be a permanent feature of the selling organization. In our opinion, such enterprise is an existing need, with the increased interest of the larger gas undertakings in the rural areas, and with the development of electricity supply under the Government scheme, through which rural business is to be seriously sought and cultivated. Thus, we anticipate, the travelling gas showroom will become an important adjunct to the selling operations of many important gas undertakings. Whether or not that is so, the York Company and their Engineer and Manager must be thanked for pioneering the new method of carrying the messages of gas to the furthermost and isolated parts of their area, and for illustrating its feasibility and value.

The Misleading "Average Price"—Midlands Electricity Scheme.

THE Electricity Commissioners are not allowing the grass to grow under their feet in evolving the regional electricity generation and transmission schemes which, when eventually pieced together, will cover the whole land. First we had the scheme for the Central Area of Scotland; then the great South-Eastern Scheme; and now the Commissioners have submitted to the Central Electricity Board a scheme for the Midlands. From the calculations, it would appear that these three schemes alone will entail, in the first instance, a capital expenditure, in round figures, of £26,000,000. The Central Scottish Scheme, according to the computations, will absorb £5,975,284, the South-Eastern Scheme £12,344,840, and the Midland Scheme £7,634,079. These huge sums represent payments for greater availability and hoped-for, but much doubted, reductions of price to the consumers. The Commissioners themselves confess that nothing but a continuous large increase in consumption will bring profit from the grandiose work which has been undertaken. Augmentation of consumption, particularly in the domestic field, can only result from a considerable lowering of price for the various uses. Probably in the Midlands area electricity is already being generated as cheaply at the larger stations as anywhere in the country; and therefore there can be little margin for further reductions in prices, with the charges which the new capital expenditure on the scheme will impose on future business. For example, in 1925-26 the average price for all classes of consumers in the Midlands was just under 1½d. per unit, and it was only 1d. in Derby. In such circumstances, having regard to the additional capital obligations which the scheme involves, what is the use of the Commissioners saying that all the economies which are realized are to be handed on to the public in the form of cheaper supplies? We should think there is no one except the Commissioners and the Minister of Transport, and probably in a less degree the members of the Central Electricity Board, who really believes that the scheme is going to effect any economies at the point of delivery, and therefore reductions of price to the consumers. Mr. Archibald Page, Chief Engineer to the Board, has deliberately and distinctly stated that the domestic consumption must be vastly developed in order to achieve a reduction of price; and thus it seems to us, keeping in mind the additional capital charges introduced by the scheme, that the increased domestic consumption could have been obtained just as well under the existing generating régime as from

all the reconstruction, re-organization, and additions which constitute the big project now well in hand.

All who are in any way responsible for the scheme—the Electricity Commissioners, the Central Electricity Board, and the Minister of Transport—have the bad habit in this connection of referring to reductions of the average price in the country. It is true the average price of electricity has been lowered. This, however, has been due not to the Government Scheme, but to operations under the existing order of things. And when we come to investigate the actual means by which the reduction of the average price of electricity has been obtained, it is found that it is not through universally lower prices to the domestic consumers, but in major part through the operation of the increased power consumption at prices ranging from a fraction of a penny to something a little above. The greater the predominance of power consumption over domestic consumption, naturally the lower becomes the average price of the whole supply in the country. We have recently had before us some striking figures in an article by Mr. D. J. Bolton in the "Electrical Review," which show that in 1924 the domestic consumers took only one-fifth of the total units sold in the country, but they contributed practically 50 p.ct. of the total revenue. On the other hand, the power consumers contributed only 42 p.ct. of the total revenue, while consuming nearly 70 p.ct. of the total units sold in the country. These figures show how absurd it is to take the average price of domestic and power consumption combined as any criterion of reduced charges to the ordinary consumers. We also know, from official statistics, that there is a steady decrease of revenue per £100 of capital expenditure, the actual figures showing a decline from £24·6 in 1921-22 to £19·8 in 1925-26. This "average price" business is misleading domestic electricity consumers throughout the country; and the Electricity Commissioners and others have only themselves to blame for it, inasmuch as a large proportion of domestic consumers know little or nothing about the application of electricity to power purposes in industry, or about its influence on the average price. Only a short time ago, Sir John Snell, Chairman of the Commissioners, predicted that in a few years' time the average price of electricity might be not more than 1d. per unit; and, in consequence, many householders, so we are told, have been hoping that eventually big economies wil arise from the Government scheme, which they will enjoy through a reduction in the prices charged them to something like 1d. per unit. Yet, while the average price continues to be quoted, there is an official warning against any such hope being encouraged by the domestic consumers. In an interview with a Press representative, Sir John Snell now states that, having regard to the economies which will result from increased output and the improved methods of distribution, it "might be possible soon" for the consumer to get his domestic supplies at 3d. to 4d. per unit, and certain classes of industrial consumers for as little as ½d. or ¾d. It will be observed that in this statement there is caution. "Might be possible" is non-committal, and "soon" is an elastic term to which Sir John does not give any definition.

Now a few particulars regarding the Midland Scheme. The area it covers is some 7311 square miles, with a population of 5,218,146. It comprises the counties of Leicester, Northampton, Warwick, Stafford, and Worcester, with the greater portions of eight neighbouring counties. The territory embraced extends from Stoke-on-Trent and Mansfield in the North to Buckingham and Tewkesbury in the South, and from Newark and Higham Ferrers in the east to Shrewsbury and the Welsh border on the west, with Birmingham and the Black Country practically in the centre. Our readers are aware of the numerous industries carried on within the counties named. The electrical consumption in the area between 1921 and 1925 increased at an average rate of 91 million units per annum. The latest figures show that in 1926-27 the number of units sold was 762 millions, which corresponds to 146 units per head of population. As we have said, the success of the scheme depends entirely upon the materialization of the Commissioners' computations in respect of the increase of consumption. They generously calculate that by 1934 the annual growth will have been at the rate of 130 million units, and that sales will then amount to 1890 millions, corresponding to 362 units per head of population. There are in existence in this region 46 public generating stations; and, for the purpose of the scheme, it is proposed to name 19 as selected stations, with an additional 6 which are to continue working under temporary arrangements with their respective proprietors. The remainder are to be closed-down or converted as circumstances dictate. When the scheme reaches maturity, it is estimated that the gross savings to authorized electricity undertakings will be £1,401,892. The word "gross" is worth pondering over in conjunction with the statement that this saving must be returned to the consumers in the form of cheaper supplies. To what extent they will be cheaper is very problematical. Some authorities of standing equal to that of the Electricity Commissioners are anticipating that the scheme, instead of producing reductions in price, will have a contrary effect. What is gained on the generating "swings," they fear will be more than lost on the transmission "roundabouts." The next scheme will deal with the North-West of England and North Wales.

Profitable Gas-Works Unification.

An extremely useful paper was given by Mr. Alexander McDonald, B.Sc., of Motherwell, at a recent meeting of the Western District of the Scottish Junior Gas Association. It treated of an investigation made to ascertain whether it would be better to centralize the gas-manufacturing operations of Motherwell and Wishaw, instead of allowing them to continue a separate existence. And the answer was in the affirmative. It was shown that eventually there would be a net annual gain from the consolidation (on the basis of the conditions on which the estimate was made) of £5580 per annum, or about 3½d. per 1000 c.ft., which could be passed on to the consumer. Of course, time is required for the change and development; and Mr. McDonald asserts the satisfaction of all concerned that the computed gain will be ultimately an accomplished fact.

Coal Contracts.

In the first editorial article in the "Journal" last week, reference was made to the long-period and normal coal contracts which have already been entered into. Prices have been tempting; and with the prospect of the regulation of output and thus a reduction of surplus stocks at the pits, together with the threat of coal owners to finance their selling schemes—at any rate, the Five Counties and the Scottish ones—from public utility concerns, we are not surprised to learn from our market correspondents that gas undertakings are well alive to the need for negotiating immediate contracts. The Durham owners have been losing contracts abroad; and probably that factor will be an inducement to them to endeavour to obtain for that area more of the home business that is going for future delivery of gas coal.

Loyalty and the Coal-Selling Schemes.

Speaking at a meeting at Wakefield a few days ago, Mr. Walter Hargreaves, Chairman of the West Yorkshire Coal Owners' Association, advised those present to "keep an eye on the end of 1928." The reason for the advice appears to be that the speaker is inclined to think that by that time we shall be able to gauge whether or not the Five Counties Coal-Selling Scheme is going to be effective or otherwise. We seem to detect in the speech-making of some of the prominent coal owners a little uncertainty as to whether or not the schemes are going to succeed. For instance, Mr. Hargreaves says: "If the recommendations are adhered to, and followed by the industry, then I am perfectly sure that, by the end of next year, a very considerable part of the black cloud now hanging over it will be removed." The "if" is significant, and so is the statement that whether there will be improvement depends a great deal on individual adherence to the programme, regarding which no man at present knows what is going to happen.

South Wales Scheme Starts.

Turning to South Wales, the Coal-Marketing Association came into being last Wednesday. In an official statement, Mr. Finlay Gibson, Secretary of the Committee set up in connec-

tion with the scheme, stated that, as a result of the favourable replies received from the colliery companies, it had been decided to complete the project immediately. It is understood that the Group Committees met yesterday, and appointed the members for the Executive Committee, who will at once enter upon their functions. Here, again, we have Mr. Gibson saying that the Committee who have been dealing with the matter have had a long and arduous task to overcome most of the difficulties, which "most" indicates that there are still difficulties to be surmounted or survived.

Coal Markets Abroad.

During the long coal strike in this country, coal owners lost a considerable part of their trade abroad, though last year the demand was fairly good, but much short of the amount of business before the war. This year, however, there has been a gradual falling-off in the export business in both quantities and prices. As readers of the "JOURNAL" are well aware, the new coal-selling schemes in this country have been designed to draw higher prices from home consumers, especially public utility undertakings, with a view to assist the coal industry to a more economic state, and to provide funds for use in the effort to recover lost trade abroad, which can only be done by under-cutting other countries. A report from Warsaw indicates that the Polish coal owners are taking a leaf out of the book of their British peers. During the coal stoppage Poland obtained a hold on the Scandinavian coal markets; and now they are proposing, in view of what is being done in this country, to secure permission to increase the home prices of coal, in order to assist them to maintain their business in foreign markets, and so "develop their mines normally and efficiently." Tyneside, it is stated, have lost the Swedish State coal contract; and another contract for £10,000 for coal for the Athens Gas-Works has gone to Germany. Respecting the latter, report says that the lowest tender from the Newcastle area was about 3d. a ton higher than the German tender. That difference is a narrow one, and might be easily wiped out by quality.

Coal Output in February.

There was consistent good production of coal throughout February. During the week ended Feb. 4, the output was 5,045,400 tons, with 968,400 workers. In the week ended Feb. 11, 5,020,400 tons were produced with 965,800 workers. The week ended Feb. 18 gave an output of 5,035,300 tons, with 961,500 workers; and the contribution of the week ended Feb. 25 was 5,018,200 tons, with 957,800 workers.

Burden of Local Rates.

A deputation of the Federation of British Industries, headed by Lord Gainford, has had an interview with the Chancellor of the Exchequer to discuss subjects connected with the forthcoming Budget. Many topics were discussed, and replied to by Mr. Churchill. Among them was a reference to the burden of local rates; but the Chancellor was careful not to commit the Government to any promise to deal with the matter. He stated, however, that the deputation might be sure, if he was able to take up the problem of local rates as pressing upon industry, he would certainly not deal with it without securing proper safeguards for the national Exchequer. He added: "It is idle to suppose there is no room for economy in local government as well as national government, and both these processes ought to proceed together. It does not follow at all that strict desire for economy cannot be made to harmonize with proper and efficient services." Budget Day is fixed for April 24.

Weak Bridges and Bridges Over Level Crossings.

Owners of pipes and cables for transmission purposes are interested in this subject. In the House of Commons the other day, Lieut.-Colonel Ashley, Minister of Transport, announced that, during the coming financial year, £250,000 would be set aside for the reconstruction of weak bridges and the construction of bridges to replace level crossings. Considering the amount of work that is waiting to be done in these respects, £250,000 appears to be on the niggardly side.

Miners' Industrial Union.

The General Council of the Trade Union Congress have been making efforts to induce the Nottinghamshire coal owners to recognize the Notts. Miners' Association, which is a member of the Miners' Federation. The success of the new industrial and non-political organization (of which Mr. George Spencer, M.P., is President) is not liked. Representatives of the "T.U.C." Council made an excursion to Nottinghamshire for a joint conference with the coal owners. The line they took was that they wished to secure an agreement which would permit freedom of choice for the men employed in the Nottinghamshire collieries in respect of membership of a trade union, and so obtain recognition for the Notts. Miners' Association. The reply of the owners was that they could only recognize one organization, and that they intended loyally to carry out the agreement made with the representatives of their workmen. In other words, they will not recognize any organized body of workmen other than that with which they are now dealing. This no doubt is the decision expected by the General Council. It is certainly the one that all right-minded men expected from the Notts. coal owners. They cannot treat agreements as mere "scraps of paper;" and they have had experience of the Notts. Miners' Association and of the Miners' Federation.

Unemployment Decrease.

The tide of employment is rising, which is an excellent sign. It assists belief in the prediction that better times are at hand for the trade of the country. The unemployed on the registers of the Employment Exchanges on Feb. 6 numbered 1,162,200, which was 6741 less than the week before. On Feb. 13, the figure was 1,159,772, which was 2428 less than at the end of the previous week. On Feb. 20, the number was 1,136,700, or 23,072 fewer than the week before. On Feb. 27 the figure stood at 1,108,700, or 27,987 less. Thus between Feb. 6 and 27, 53,500 more persons were at work. The number of wholly unemployed on Feb. 6 (836,600) was reduced by Feb. 27 to 803,600—a difference of 33,000. The temporarily stopped on Feb. 6 (260,600) was reduced to 237,500—an improvement of 22,500. Those normally in casual employment numbered 65,000 on Feb. 6; by Feb. 27, the figure had risen to 67,500, or 2500 more. The general trend is satisfactory.

MURDOCH LODGE, No. 3480.

Installation Meeting.

The Installation Meeting of the Murdoch Lodge, No. 3480, was held in the Connaught Temple at the Imperial Hotel, Birmingham, on Thursday last, and was well attended by members and visiting brethren.

The Lodge was opened by the reigning Master, W.Bro. H. V. Stanton, P.M., No. 498, Provincial Grand Treasurer (Worcs.), who afterwards conducted the ceremony of installing the Master Elect, Bro. William A. Twine. The newly installed Master subsequently appointed and invested his officers, and presented a Past-Master's jewel to W.Bro. H. V. Stanton in recognition of his services during his year of office.

The following is a complete list of officers for 1928-9:

W.M.	W.Bro. W. A. Twine
I.P.M.	W.Bro. H. V. Stanton, P.M. 498, 3480, Prov. Grand Treasurer (Worcs.)
S.W.	Bro. R. J. Meiklejohn
J.W.	Bro. J. Brettle
Chaplain	W.Bro. W. J. Rendell Baker, P.M. 3480
Treasurer	W.Bro. F. Jervis, P.M. 3480, 1719
Secretary	W.Bro. T. H. Poulson, P.M. 1896, 4281
D.C.	W.Bro. S. O. Stephenson, P.M. 3480, 2385, 4252, P.P.S.G.D., P.P.S.G.D. (Sussex), P.P.Asst.G. Sec. (Worcs.)
S.D.	W.Bro. J. R. Duff, P.P.G.Org. (Oxon)
J.D.	Bro. W. G. S. Cranmer
Asst. D.C.	W.Bro. R. Scott, P.M. 3480
Almoner	W.Bro. Vincent Hughes, P.M. 3480, 3582, P.P.A.G., D.C., P.P.G.P. (Staffs.)
Organist	W.Bro. R. J. Milbourne, J.P., P.M. 3480, 1896, P.G., STD.B.Shrops.
Asst. Sec.	Bro. J. H. Burrows
I.G.	Bro. A. Mackay, S.W. 3053
Senior Steward	Bro. L. G. Wilkes
Junior Steward	W.Bro. E. S. Stamp, P.M. 473, Prov. G.D.C.
Asst. Stewards.	Bro. T. F. E. Rhead Bro. E. B. Tomlinson Bro. W. H. Adams Bro. W. E. Stevenson
Tyler	Bro. W. Littler

At the conclusion of the Lodge meeting, a banquet was held, at which the W.M., W.Bro. William A. Twine, presided. The loyal and usual toasts were pledged and honoured.

PERSONAL.

Mr. Charles E. Dovey, who was Chairman of the Cardiff Gas Light and Coke Company, and a well-known chartered accountant, left £113,896.

It was reported at a meeting of the Plymouth Corporation Gas Committee on Thursday, March 22, that the Engineer, Mr. C. C. Barber, had met with a rather serious accident. He sustained a broken ankle in a fall when descending the steps of a tramcar in the town.

Mr. Ronald F. Rew, who served his Articles in the Technical Departments of Messrs. Willey & Co., Ltd., of Exeter, and has latterly acted as Assistant Engineer to the Devon Gas Association, Ltd., has now been appointed Engineer in succession to Mr. R. J. Rew, who will retain his position as Managing Director of the Association.

Employees of the Oswaldtwistle District Council Gas Department have presented Mr. Thomas Haworth, Assistant Engineer and Manager, who has been appointed Gas Engineer and Manager at Ripon, with an artist's autograph proof of "Through the Wood," by Joseph Farquharson, R.A. Mr. A. F. Ames (Manager) made the presentation. Following Mr. Haworth's resignation, the Gas Committee have appointed Mr. Eric Farnworth as Technical Assistant. Mr. Farnworth has been a pupil at the works for some time.

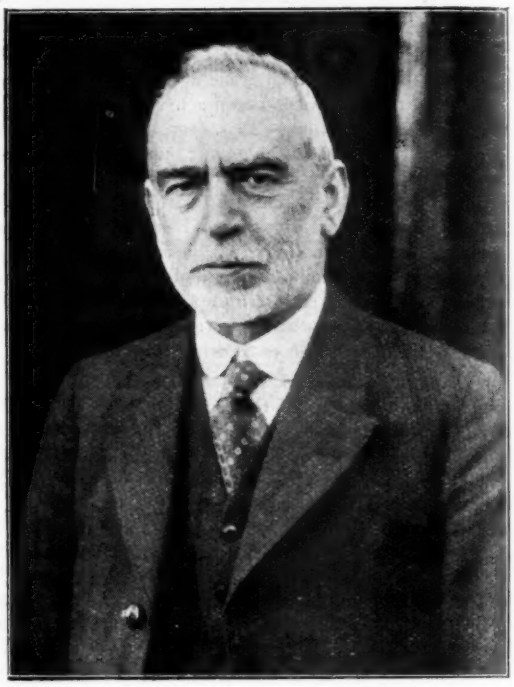
OBITUARY.

The death occurred on Wednesday, March 21, at the age of 58, of Mr. Andrew C. Fawcett, of Wensleydale Terrace, Blyth, Northumberland, after a prolonged illness. Mr. Fawcett, for a period of over 34 years, was Secretary to the Blyth Gas Company.

The death occurred on March 19, after a four months' illness, of Mr. J. W. Thompson, Gas and Water Engineer and Manager to the Barnoldswick Urban District Council. A native of Embsay, near Skipton, Mr. Thompson was 64 years of age, and had been Gas Manager at Barnoldswick since 1903. During his charge there the undertaking has been considerably extended, and the horizontal retorts have been replaced by verticals. He recently aroused interest by his paper on "Dry Oxide Purification," before the Manchester District Institution of Gas Engineers and Managers last November, relating to a process of purification which he had devised. His two sons hold positions as Assistant Gas Managers at Colne and at Skipton.

The funeral of Mr. Peter Robertson, whose death was announced in last week's "Journal," took place on Monday, March 19, in the crematorium of Norwood Cemetery, previous to which a short service was conducted in the adjoining church by the Rev. Alfred Warcup. There were present a number of Mr. Robertson's friends from Messrs. Benn Bros., Ltd., of Bouverie House, the proprietors of the "Gas World"—including Mr. John Douglas, Mr. Beck (the Assistant Editor), Mr. Slaughter, Mr. Coopy, and Mr. Barrow. The Secretary of the Gas Light and Coke Company (Mr. W. L. Galbraith) was there, and also the Secretary of the Institution of Gas Engineers (Mr. Walter T. Dunn). Floral tributes were sent by Sir Ernest and Lady Benn, the President and Council of the Institution of Gas Engineers, the Directors of Messrs. Ernest Benn, Ltd., and others.

THIRTY-SEVEN YEARS' PUBLIC SERVICE AT WALLASEY.



Mr. J. H. Crowther, Manager of the Gas Department of the Wallasey Corporation for 35 years, who retires shortly, after being altogether 37 years with the Corporation. Mr. Crowther, who has been an engineer 50 years, was, before going to Wallasey, Water Engineer at Nottingham. During his period of service, he has been responsible for introducing the most progressive methods and up-to-date machinery into his department, with the result that Wallasey now has one of the finest gas-works of its kind in the country. When Mr. Crowther went to Wallasey the population was 30,000; it is now 92,000.

ELECTRICITY SUPPLY MEMORANDA.

The Electrical Development Association want cheap electricity—especially for boosting domestic consumption. There have been much grumbling in the Press, and several references in Parliament, to the strange dissimilarity in neighbouring areas of the charges for electricity; and defence of the divergencies is usually based on the great distinction there is in the characteristics of demand in even adjoining areas. Expansion of domestic consumption is the one thing that the Central Electricity Board are persuaded is necessary to the success of the concentrated generation and universal distribution scheme for which they are responsible under the 1926 Act. The Development Association have had their annual dinner, at which Mr. J. M. Gatti presided, while Mr. Archibald Page, the Chief Engineer of the Central Electricity Board, was the principal speaker. Of course, the position Mr. Page occupies impelled him to say that electricity is an ideal agent for providing light, heat, and power; but it would be highly interesting if he would explain how electricity can be an ideal agent in respect of heating from the economic standpoint of the consumer. He also remarked that while electricity is a mystery, the price at which it is retailed in some places is also a mystery; and, in view of the fact that it is increased consumption that is wanted, the sure way of obtaining it is by a reduction of the price. He also submitted that complicated tariffs are the first obstacle to progress, and they must go. They require to be standardized as well as simplified, and in more places than one in his position cares to contemplate. It is also his view that more enterprise is needed in providing service; and in this every section of the industry should co-operate.

What is Wanted.

Mr. Gatti seems disinclined to accept the opinion of Mr. Page that matters are wrong in respect of charges for electricity. He quoted figures in reference to some 63 authorities, who represent more than half the total consumption of current in the country. In five years these undertakings have had an increase of 61 p.ct. in consumption, and 72 p.ct. in consumers. In his view, the reason for the increase is the extraordinary cheapness of the supply. He quoted the following figures: The average price per unit throughout the country in 1913-14 was 1·77d.; in 1926-27, 1·62d. Now Mr. Gatti knows as well as anybody that a drop in the average price throughout the country is no criterion as to a general reduction of price to the domestic consumers; and averages are useful for hiding from view both the bad and the good. The reduction of the average price is achieved by the increase of the power load at the low prices charged for it. In the "Memoranda" last week, it was pointed out, on the authority of Mr. D. J. Bolton, that in 1924 the domestic consumers of the country only accounted for one-

Deception of the Average Price.

fifth of the total units sold; and yet they contributed practically 50 p.ct. of the total revenue. On the other hand, the power consumers contributed less than half the revenue (42 p.ct.), while consuming nearly 70 p.ct. of the total units sold. Naturally, the greater the power load increases, the lower becomes the average price. It is all so plausible, except to those who know the facts. In view of this, we are somewhat surprised to read in one report that Mr. Gatti said that the electricity industry is supplying electricity "throughout the country at less than pre-war rates." He asks: Is there any other industry in the country that can make such a claim? No other industry in the country makes use of the average price to show its good behaviour in the same way that electrical authorities do, while knowing full well that in it there is no evidence of benefit to the domestic consumers who supply upwards of 50 p.ct. of the revenue of the industry, though utilizing only one-fifth of its output.

In the Future.

Attention was recently called in the "Memoranda" (p. 681) to the Futurist Electric House at the Ideal Home Exhibition. Since then we have heard more ridicule regarding the absurdities of this place than praise of the ingenuity which it was designed to show. It is true that the big advertisement given to the house resulted in long queues of people desirous of seeing it; but the bulk of them went away quite impressed that, if ever this dream were realized, it would not be in their time or by them. In fact the whole thing was, for these times, void of any practical good. Following a visit to Olympia, we read an article in the "Daily Mirror," headed "Dawn of the Electric Age." It was by Dr. E. E. Fournier D'Albe, and in this the doctor allows himself to indulge in a lavish dream. He starts by telling us that Great Britain is to be electrified. A vast National Scheme, costing £280,000,000, is to cover the country with a network of cables, distributing electric energy to the factory and the home "at a price which will make it available to all." But he does not say what that price will be. Perhaps he was wise; but the electrical industry objects to people who fastens on it an obligation which may not be capable of fulfilment. He goes on to tell us that the electrical age is upon us. With current laid on everywhere, and with electrical energy as the "cheapest and most pliable source available," we shall all have to be electricians. Dr. D'Albe is a prophet; and in prophets of his kind the mass of people have little belief. He allows himself great flights in imagination. "The new age will shift the centre of the household from the fireplace to the switchboard. Vesta, the guardian goddess of the hearth, will learn to replace old lamps and mend blown fuses." Probably she will; but if modern experiences are anything to go by, we imagine that Vesta's temper will not be improved, and her language will not be endurable. But we go on to read that she will be as familiar with the dangers and vagaries of electricity (we are sorry for her) as she was with the risks and troubles of domestic fires and lamps. She will run no more danger of electrocution than she did of being burned alive. We do not at all object to that, as we do not favour electrocutions. They are horribly gruesome. However, the "angel of the house" will talk about volts and watts as familiarly as she does now about therms, anthracite, and Derby Brights. She will master the intricacies of current strength, as she has mastered the principles of cooking. In short, she will guard the new domestic centre of power as wisely and faithfully as the Vestal Virgins guarded the sacred fire in Rome. That all sounds very nice, but extraordinarily funny. We read, too, that the electricity supply industry will undergo fundamental re-organization in order to fit it for the supremely important function that awaits it in the immediate future. This we suppose refers to the great electrical scheme of generation and distribution now in hand. The Black Country will be no more; its air will be as clear as that of Devon. The serried ranks of smoky chimneys which mark the age of steam will disappear. Well-designed power stations will be set in a smiling landscape (the landscape may not then smile), and current will be carried at high pressure—over 100,000 volts—to be transformed into safe and ample current at distant centres of consumption—the factories and the homes of the people. Thus will the new age of man be ushered in. In this pretty picture it would seem that gas will have no place. Nevertheless, the article by Dr. D'Albe does not in the slightest disturb us. His predictions, to our mind, are as weak as the floweriness of his language.

Cutting-Down Initial Costs.

Two or three weeks ago, an electrical authority speaking of electric cookers pointed out that one distinct disadvantage was their initial cost in comparison with gas cookers of the same capacity. The difference affects not only the sale of such apparatus, but it necessitates higher rates for their hire, compared with the gas-using types. "Hotspot" in "Cooking and Heating Notes" in the "Electrical Times" states that he has received advance particulars of a new electric cooker that a well-known firm are placing on the market. In making this announcement, he says: "The matter is of all the more interest as an attempt has been made to get the list price down to a level that will be competitive with gas apparatus." By doing this, he believes the principal obstacle to the development of electric cooking will be overcome, as the cooker can then either be sold outright or hired for a very low figure. "Hotspot" is a cheery optimist. To be competitive with gas apparatus, there must be at a given price a definite relationship in the matter of capacity for work, but no one can say that the new model electric cooker to which he calls attention has anything like the capacity of even a quite minor gas cooker. As a matter of fact, the newcomer has merely the appearance of a gas-griller with a small oven, closed by a drop door. It is stated that it is designed to meet the ordinary everyday cooking requirements of a family of two to four persons. Such a family must have peculiarly small appetites. The overall dimensions of this "electric cooker" are only 18½ in. wide by 14 in. high by 13½ in. deep; and what is called the oven cooking space is 12 in. wide by 10 in. high by 10½ in. deep. The hob is 18 in. wide by 12 in. deep. This little arrangement contains two heating elements, the top one being an enclosed type boiling-plate, designed for the dual purpose of boiling or frying on top and grilling or heating the oven below. We must be forgiven for entertaining doubts as to the rapidity with which the dual operations can be performed. The second or oven bottom heating element is also of the enclosed type, and operates at a temperature which our friend thinks should ensure a long life. That implies a low temperature. The electricity industry appears to be rather fond of introducing toy-like structures for the purpose of producing economy, but the utility of such things is of a mean order.

The Industry's Data.

The Electricity Commissioners have issued their return relating to the engineering and financial statistics of authorized electricity undertakings in Great Britain for the year ended March, 1926, in the case of local authority concerns, and December, 1915, for the company undertakings. In the year, there were 593 authorized authorities. But not all these had commenced to function. Of 565 undertakings, 298 had local generation only, 125 local generation *plus* bulk supply, and 142 bulk supply only. The total number of generating stations was 491, with 4,421,602 KW. of plant installed. Of these plants, 92·65 p.ct. was steam turbine machinery; the remaining 7·35 p.ct. being made up of reciprocating steam plant 5·7 p.ct., oil-engine plant 1·03 p.ct., gas engine plant 0·44 p.ct., and hydro-electric plant 0·18 p.ct. Regarding the type of current, the total figure included 4,049,939 KW. of alternating current machines, and 371,663 KW. of direct-current plant. The units generated in the year (not taking into account railway, tramway, and private units) numbered 6618·6 millions, of which 5606·1 millions were sold to consumers—an increase of 11 p.ct. Sales for lighting and domestic purposes increased from 16·5 p.ct. of the total to 22·2 p.ct. of the total in 1925-26, which shows that 77·8 p.ct. was for power. The average sales for the United Kingdom was 128 units per head. The average load factor for the country was about 30 p.ct. Only in ten cases was a load factor of 45 p.ct. reached, 164 had load factors between 20 to 25 p.ct., 135 load factors of 15 p.ct., and 92 load factors of 25 to 30 p.ct. The amount of coal and coke consumed in 1925-26 was nearly 7 million tons, *plus* minor quantities of other fuel. The average fuel consumption per unit receded from 2·55 to 2·43 lbs. The capital expenditure of the companies and local authorities at the end of March, 1926, was £217,038,306, divided between generation and transmission, distribution, &c., in the respective amounts £95,248,155 and £121,790,151. Thus 56 p.ct. of the capital expenditure is outside the generating station. It is pointed out that revenue totalled £42,961,098, with inter sales representing £2,017,468. The revenue per £100 of capital expenditure has progressively decreased from £24·6 in 1921-22 to £19·8 in 1925-26, whereas the ratio per annum between total units sold and the total capital expenditure has steadily increased. The reason is attributed to tariff reductions; but, of course, another consideration is the submerging of high priced domestic consumption by low priced power consumption. An analysis of the working costs shows the average total cost per unit generated in 1925-26 was 0·4d.—a reduction of 0·06d. from the previous year. Owing to the lower price of coal prevailing, the report states (the long coal dispute had not then started) the gross surplus of revenue over expenditure in 1925-26 was £19,657,722. Of this 47 p.ct. went in loan repayment, transfer to sinking funds, and reserve renewal funds. In rate aid, contributions were made from local authority surpluses to the extent of £760,267, while certain undertakings claimed assistance from the rates to the amount of £18,236. The industry gave direct employment to upwards of 45,000 people.

Failures.

On the 20th inst., Leeds experienced a temporary stoppage of the tram service in many parts of the city, owing to the collapse of the supply of electricity. Last Saturday evening, Dublin had a failure. It occurred about 7.30 when the people were busy shopping; and tradesmen hurriedly closed their doors until they had procured supplies of the useful candle. Cinemas and theatres were also affected.

LIGHTING LETHARGY.

By R. S. Ross—A Worker in the Lighting Section of the Industry.

It is undoubtedly a hard fact, and unpleasantly true, that no part of our great industry is suffering more from competition than the lighting section. It seems to be the view among the great public that the magical word "progress" does not apply to this particular branch. The glamour of electricity, combined with continual and incessant propaganda, is working, and has worked, very definitely to our detriment. The vision of the every-day man and woman is being for ever directed to that state of existence wherein gas—and gas lighting in particular—has no place.

Undoubtedly, a great percentage of people still regard the flat-flame burner, or perhaps the old upright burner, as the acme of achievement for the gas industry. This may be unpalatable for us; but it is true. They point to switches on the wall, and say (as they have said to me times innumerable): "There, I have only to touch the switch and I get a light. Can gas do that?" I have told them that gas *has* been doing it for years; but their ignorance is so complete that it is almost as hard to convince them as it would be to empty a well with a sieve. Why have the public never been forced to realize a small thing like this?

Where are our propagandists proclaiming from the housetops that "gas lighting is modern?" There are a few—alas, too few—crying in the wilderness. The canker of indifference has eaten deeply into a great number of our own members. Time after time I meet workers in the gas industry itself who shrug their shoulders when lighting is mentioned, as much as to say: "Well, it's going. It's a pity, but it can't be helped."

A short time ago I was sent to a large northern town to canvass for lighting; and when I arrived I was greeted with the cheering words: "So you have come up here on the thankless task of canvassing for gas lamps, have you? We find that once they have got electricity in they never take it out." It apparently had not occurred to them that they never *would* take it out if gas sat down and strewed the ashes of self-pity on its head, and never went out to prove that it, too, could offer something equally good, and in nine cases out of ten considerably cheaper. No; they were content to let it go. I spent a month there, and found the task anything but thankless.

A business man does not want much convincing that it is better for him to light his shop at (say) a shilling an hour, than to pay eighteenpence. In other words, a man in business *is* in business. He is not running a philanthropic institution, and for him to pay eighteenpence when a shilling will do is nothing but rank bad business. He probably never realized that he could save money, simply and solely because he had not been told. It is up to us to do the telling; but it is no use the telling being done by one who in his own heart is convinced that gas lighting is finished. It isn't.

We know of the beauty of modern gas fittings, of the great candle power that can be obtained on an almost negligible consumption, of the combination of light and warmth, that gas lighting is infinitely better for the eyesight, and many other admirable points. But what is the use of *our* knowing all this, if we guard it as some inviolable secret, or, worse still, let it all go by the board because we have been told over and over again that something else is better (or rather claims to be), and that the decay of gas lighting is inevitable? Death is inevitable; but does anyone let life go without a fight? Let there be no mistake. Gas lighting *will* go unless the members of the gas industry, in the first place, are roused to fight for it. When we ourselves are convinced that it is far from being dead, then the public will listen; but they will not listen to an apologist.

Let every gas company adopt a system of hire and maintenance (for it is only by this method that modern apparatus can be forced upon public notice), and above all act up to the full meaning of the word "maintenance." It is in this way only that the consumer will always have good lighting at very little expense, and no trouble to himself. Every man will gladly push his troubles on to other shoulders. So let the gas companies take the responsibility, which will be practically negligible, for with efficient maintenance there should be no troubles.

If lighting goes first, what will follow? Retain the lighting, and you retain the rest; lose the lighting, and the chances of losing the rest are increased a hundredfold.

BOURNEMOUTH GAS & WATER COMPANY'S NEW SHOWROOMS AT POOLE.

The accompanying photographs of the new showrooms of the Bournemouth Gas and Water Company which have just been opened at Poole may be of interest to our readers. For a period of nearly 25 years the Company's only showroom in Poole was in the picturesque ivy-clad Georgian house shown at the left of one of the photographs; but although this gave fair accommodation for the display of gas apparatus, from the selling point of view it was greatly handicapped by the fact that it lay back from the road, was approached by steps, and had no window space available for display.

It had been felt that a modern showroom, with facilities for the proper display of goods, was necessary in Poole; and the Directors of the Company decided last year that the time had come to provide this. They were fortunate in having as their Architect Mr. W. T. Reynolds, L.R.I.B.A., of Messrs. Reynolds & Tomlins, Bournemouth, who was responsible for their new head offices and showrooms in Bournemouth. How well he succeeded in designing a building which would harmonize with the lines of the old building will be seen from the photograph. The old showrooms are approached from the interior of the new showrooms by a broad staircase, so that the whole of the old and new accommodation is available for the display of gas appliances.

We have to thank Mr. Philip G. G. Moon, the Engineer and General Manager of the Company, for affording us the opportunity of publishing photographs of this fine example of modern showroom design.

THE OLD PREMISES RECONSTRUCTED.

INTERIOR OF THE NEW SHOWROOM.

"B.C.G.A." South Western District Conference.—In the Ilfracombe Hotel, Ilfracombe, on Friday, April 13, there will be a British Commercial Gas Association South Western District Conference, under the Presidency of Mr. R. M. Rowe, C.C., the Chairman of the Ilfracombe Gas Company. Following a welcome by the Chairman of the Ilfracombe Urban District Council (Mr. F. W. Houlford, J.P.), the President will address the conference, and Mr. F. W. Goodenough, C.B.E. ("B.C.G.A." Executive Chairman), will make a statement respecting the work and policy of the Association. Luncheon will be at the invitation of the Chairman and Directors of the Ilfracombe Gas Company; and in the afternoon there will be a paper on "Gas Service in Relation to Health and Hygiene," by Mr. J. Armstrong, Engineer and Managing Director of the Ilfracombe Gas Company. The discussion on this will be opened by Dr. D. C. Adam, Medical Officer of Health for Ilfracombe, who will be followed by Mr. H. D. Madden, of Cardiff, and Mr. W. N. Westlake, of Exeter.

"Chemical Engineering and Chemical Catalogue."—The fourth edition of this useful compilation has been published at 15s. by Leonard Hill, Ltd., 173, Fleet Street, E.C.4. The editor of the volume is Dr. D. M. Newitt; and the new edition contains much more information than preceding ones. This fact has necessitated a larger page and a tab system of sectioning, so that the standard of clarity might be maintained. The list of contributors and co-operators in the work bears testimony to the status of the catalogue.

A "COLOSSAL" GASHOLDER IN THE 'FIFTIES.

Writing last week, Mr. Frank L. Wimhurst, the General Manager of the Newcastle-under-Lyme Gas Department, says: "There has recently come into my possession a number of old papers relating to the Newcastle-under-Lyme Gas Company, which dates back to the year 1819, when it received its original Act of Parliament.

"Among these papers is what appears to be a copy of a paragraph from some newspaper published in the early part of 1853, at least the paper in my possession has written on it in hand: 'Smethwick, Nr. Birmingham, April 8, 1853, to the Chairman of the Newcastle-under-Lyme Gas Company.' At the foot of the printed paragraph is written: 'With Joshua and William Horton's respectful compliments.' On the blank fly-leaf of this same paper is written in another handwriting: 'Joshua and Wm. Horton, Smethwick, Birmingham, No. Tender.'

"It would therefore appear that the Newcastle-under-Lyme Gas Company were about that time inviting tenders for a gasholder; but whether this holder was proposed to be erected on the site of the old works or the site of the present works, to which they removed in about the year 1855, when the second Act was obtained, I am unable to say.

"In any case the copy of the paragraph I enclose might be of some interest to your readers, and it is for this purpose I send it for your perusal."

[Enclosure.]

TO THE CHAIRMAN OF THE NEWCASTLE-UNDER-LYME GAS COMPANY.

A Monster Gasometer.—Dr. Lardner's demonstration of the impossibility of a steamship crossing the Atlantic, and the remark of a member of a Committee of the House of Commons that George Stephenson was only fit for a lunatic asylum, because he ventured to say that it was possible to make a locomotive travel fifteen or twenty miles an hour, may now be coupled with another ridiculous instance of how completely the results in such matters are at variance with the most confident predictions. Some few years ago several of the most eminent engineers of the day (Messrs. Bramah and Donkin being, we believe, among the number) gave evidence before a Parliamentary Committee to the effect that a gasometer of greater diameter than 35 ft. would be very dangerous, and recommended that in all cases where the limit was approached, a series of strong walls should be built round the gasholder in order to lessen the injury which the almost inevitable explosion might entail. Though practical men subsequently proved such an idea to be chimerical, no one has ever attempted to manufacture a gasometer at all approaching in size one which we have this week seen at the extensive works of Messrs. Joshua and William Horton, at Smethwick. Its diameter is no less than 165 ft. Its colossal dimensions, however, do not form its only noteworthy characteristic. In such a work the raw material employed is usually the chief part of its cost; and by bringing a recent patent to bear upon the construction of the one under notice, the Messrs. Horton have effected a saving of not less than £2000 in this respect, through the absence of the heavy iron framework which usually supports the roof (if we may so call it) of a gasometer. The top, therefore, instead of being concave, is quite flat; experience having proved that with a certain mode of construction all internal support is superfluous. It is being made for the Sheffield Consumers' Gas Company. The Messrs. Horton are also engaged in manufacturing telescopic gasholders on a new principle (the subject of another patent), by which still further economy in labour and material is ensured; and we were shown an improved tubular boiler, by the use of which one firm in Birmingham was said to be saving from £600 to £800 a year in the smaller amount of fuel which was required, as compared with ordinary boilers.

We thank Mr. Wimhurst for giving us the opportunity of placing on record this interesting statement as to how gasholder dimensions were viewed three-quarters of a century ago.

FORTHCOMING ENGAGEMENTS.

March 30.—London and Southern District Junior Gas Association.—Meeting in the Westminster Technical Institute. Paper by Mr. F. C. Smith, of the Gas Light and Coke Company.
April 3.—Central Committee of the Federation of Gas Employers.—Meeting at noon.
April 3.—Central Executive Board of the National Gas Council.—Meeting at 2.30.
April 4.—Institution of Heating and Ventilating Engineers.—Visit to Watson House.
April 10.—National Gas Council.—Meeting of the Central Executive Committee.
April 10.—Federation of Gas Employers.—Meeting of the Central Committee.
April 12.—Midland Junior Gas Association.—Meeting.
April 13.—British Commercial Gas Association.—Conference of the South Western District at Ilfracombe.
April 14.—London and Southern District Junior Gas Association.—Visit to the tankless holder and showrooms at Woodford, and the Stratford Works of the Gas Light and Coke Company.
April 14.—Scottish Junior Gas Association (Eastern District).—Visit to the Works of Messrs. R. & A. Main, Ltd., Falkirk.
April 24.—Southern Association of Gas Engineers and Managers (Eastern District).—Meeting at Tunbridge Wells.
May 3.—Wales and Monmouthshire District Institution of Gas Engineers and Managers.—General meeting at Tredegar (Mon.).
May 9.—British Commercial Gas Association.—Conference of the Midlands District at Redditch.
May 16-17.—Eastern Counties Gas Managers' Association.—Meeting at Bedford.
May 17.—Society of British Gas Industries.—Annual general meeting at the Hotel Cecil, W.C. 1, under the presidency of His Grace the Duke of Sutherland.
May 18.—Southern Association of Gas Engineers and Managers.—Visit to the works of the Rochester, Chatham, and Gillingham Gas Company.
May 22.—Central Committee of the Federation of Gas Employers.—Meeting at the Hotel Cecil, 10.30.
May 22.—Central Executive Board of the National Gas Council.—Meeting at Hotel Cecil, 11 o'clock.
May 22.—Federation of Gas Employers.—Annual general meeting at the Hotel Cecil, 2.15.
May 22.—National Gas Council.—Annual general meeting at the Hotel Cecil, 3 o'clock.
May 24.—British Commercial Gas Association.—Conference of the Cornish District at Truro.

The Institution of Gas Engineers.

All meetings take place in the Council Room at 28, Grosvenor Gardens, unless otherwise stated.
April 2.—Special General Meeting of the Institution for submission of Terms of Royal Charter.
April 2.—Finance Committee, Emergency Committee, and Council Meetings—all at the Institution of Electrical Engineers, Victoria Embankment.
April 3.—Gas Education Committee.
April 28.—Examination in Gas Engineering and Gas Supply held at centres in England, Wales, and Scotland.
May 1.—Refractory Materials Joint Committee.
May 7.—Sub-Committee of Gas Investigation Committee, to be held at Leeds University.
May 8.—Executive Committee of Gas Education Committee.
May 22.—Gas Investigation Committee in morning. Effluents Research Committee in afternoon.
June 12-15.—Annual General Meeting at Cardiff.
July 10.—Gas Education Committee.
Oct. 9.—Gas Education Committee.
Nov. 13.—Executive Committee of Gas Education Committee.
Dec. 11.—Executive Committee of Gas Education Committee.

Eliminating "Bloating" in Determination of Coal Ash Fusion Points.

In a communication to the "American Gas Association Monthly," Sandford S. Cole, of the Koppers Company, remarks that, in the determination of the softening temperature of coal ash—*i.e.*, the temperature at which a cone of the ash has fused-down to a spherical lump—an alteration in the structure of the cone often occurs which is termed "bloating." This is troublesome, because if the cone "bloats," and forms a mass twice the size of the original cone, it is difficult to determine accurately the softening temperature. According to the standard method set forth by the American Society for Testing Materials, the coal is first burned to ash at a temperature of 800°-900° C., then ground to pass a 200-mesh sieve, and finally ignited at 800°-850° C. in the presence of oxygen. Unless special pyrometric equipment is provided, it is difficult to determine accurately the temperature. In the Koppers laboratory, certain coal ash which was prepared without temperature control, and which "bloated" excessively, was burned-off a third time at 800°, 850°, 900°, 950°, and 1000° C., and the softening temperature determined along with a cone of the original ash. It was found that the ash burnt-off above 850° C. did not "bloat." This was confirmed by using the original coal and burning to ash at a temperature above 850° C., when "bloating" did not occur. Thus the cause of "bloating" was apparently a too low furnace temperature in preparing the ash.

W-D

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ORDERS RECEIVED

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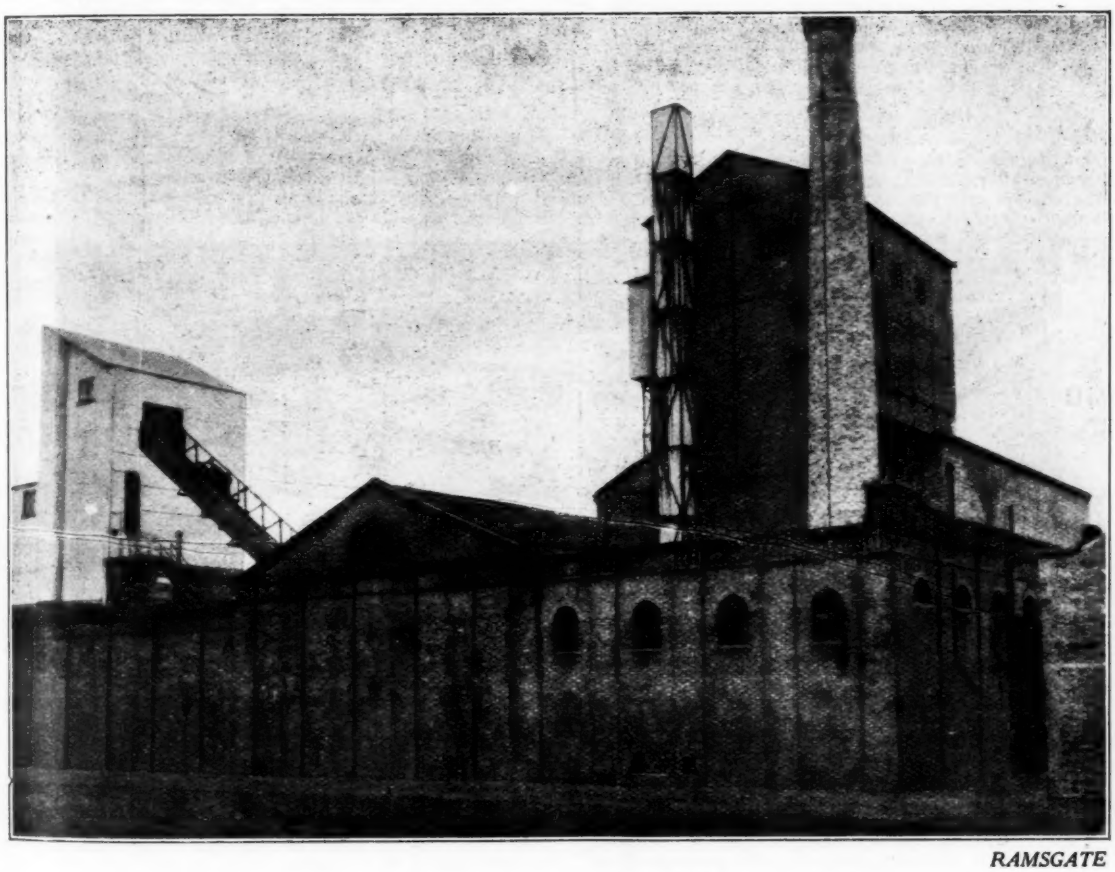
GLASGOW (Dawsholm Works) *(in course of Erection)*	230	,, ,,
TAUNTON *(Working)* - - - - - - -	24	,, ,,
CROYDON - - - - - - - - -	230	,, ,,



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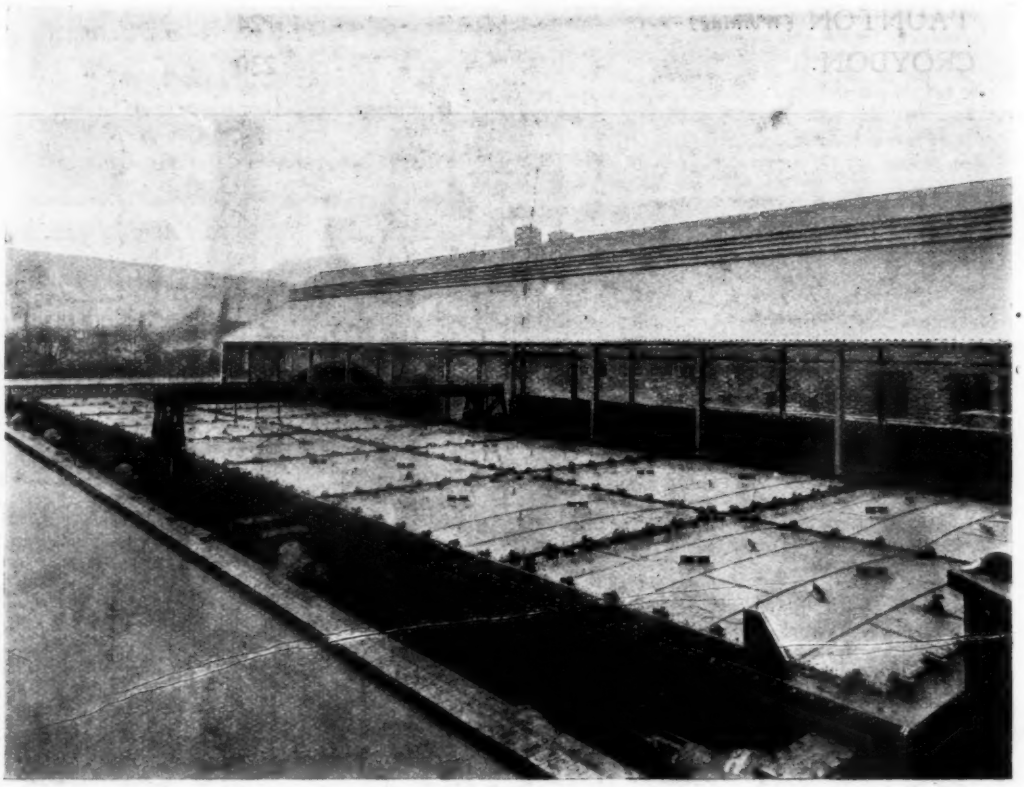

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GASHOLDER MAINTENANCE.

By F. SOUTHWELL CRIPPS, Assoc.M.Inst.C.E.

The "JOURNAL" for March 21, 1928, made an important announcement to the effect that the American Gas Association have appointed a "Special Committee to prepare recommendations as to practice for the conduct of repair work on gasholders."

Is it not incumbent upon the English Institution of Gas Engineers to do likewise? There are so many gasholders in this country which have seen their best days; and as time goes on they will either end in disaster or be condemned and demolished. This points to the absolute necessity of a regular system of examination and repair as long as they are in use. Naturally, one does not wish to discard them sooner than necessary, as they are expensive structures. Hence thorough examination and repair should take place periodically.

It should be noted that gasholders are required to sustain a far greater pressure of gas than in bygone days. Old gasholders are often called upon to do so, sometimes by weighting the inner lift, and sometimes by adding another lift, and, it is feared, without in some cases giving so much as a thought to the strength of the crown sheeting or the top curb—the most vulnerable parts in all gasholders, from a strength point of view. It should be remembered that the stress on the top sheeting is directly proportional to the pressure of the gas. If, for example, the pressure is doubled, the stress on the sheeting is likewise doubled. Again, just as the strength of a chain is its weakest link, so the strength of the crown sheeting is its weakest joint. Normally, the stress on the crown is uniform throughout; but if any of the joints in the sheeting yield, the stress is thrown out of balance and extra stress is set up locally, which is dangerous.

The strongest and best proportioned single riveted lap joint cannot exceed 56 p.ct. of the solid plate or sheet. Hundreds, if not thousands, of holders exist in which the crown sheeting is only $\frac{1}{8}$ in. thick, and the rivets are about $\frac{1}{2}$ in. diameter 1 in. pitch, or $\frac{7}{8}$ in. diameter $1\frac{1}{4}$ in. pitch. Therefore it is important that the greatest care should be taken to prevent rust or corrosion, particularly of the riveted joints. If a joint is defective in this way for a few feet only in length, and yields under stress, the stress on the rest of the joint is greatly increased, and the tendency is to rip open like a sheet of paper. [Cut a slit in a piece of paper and pull the opposite sides. This will illustrate exactly what takes place if a small length of any joint in the crown yields.]

The crown is referred to particularly, because the stress on the side sheeting does not approach that on the crown, and therefore the thickness of the side sheeting is frequently less than $\frac{1}{8}$ in. The side sheets are made thicker occasionally, for other reasons than theoretical requirements—viz., durability, rigidity, avoidance of buckles, &c. The factor of safety in the top sheeting, however, especially in fairly large holders, is seldom more than 4, even when quite new and with the best-proportioned joints and workmanship. Hence there is not much margin for deterioration. Of course, the stress on the top sheeting varies not only as the pressure of gas, but also as the radius of the sphere of which the crown is a segment.

Bearing all this in mind, it will be admitted that gasholders are scarcely the things to play with, and the safety of the public, apart from the company's or corporation's interests, demands that every possible precaution should be taken to avoid disaster. How is this to be done?

(1) No alteration in the working or construction of the holder, such as increasing the gas pressure therein, by adding new lifts or weights to the floating vessel, must be permitted until the holder has been subject to examination by a qualified expert.
(2) By periodical examination as to its condition, and proper provision made for meeting increased stresses if any.
(3) It should be condemned when it is found to be unsafe and beyond restoration as to strength, &c., just as a ship is condemned when unseaworthy.

Who is to be considered qualified, and how, and by whom, is it to be carried out, are questions for the Institution to consider, in the face of the too frequent accidents which have recently taken place. Of course, it is not to be expected that the manager of any small works, and, I fear, many large ones, is to be entrusted with such duties. Gas engineers should not only be trained on a gas-works, but have several years' training in contractors' offices and works, where gas-works plant is actually constructed, and in addition should receive a scientific training in structural engineering.

MODERN HANDLING PLANT FOR COAL STORAGE AT GAS-WORKS.

The Cable Drag Scraper Principle.

[SPECIALLY CONTRIBUTED]

There is little need to emphasize the importance of mechanical coal handling at gas-works; and in comparison with the present general methods, such as cranes, conveyors, travelling bridges and telphers, interesting claims are now being made on behalf of the Beaumont cable drag scraper as a means of storing and reclaiming large piles of coal on ground adjacent to a rail track or canal. One of the main points, for example, is the flexibility of apparatus of this description, so that the shape of the storage area, whether square, rectangular, or irregular, does not make any difference—generally an important item.

The coal is received at the plant in (say) 10 or 20 ton standard railway wagons, and is discharged into a receiving hopper situated below the track level, from which an automatic skip hoist picks up the coal and delivers it down a chute from a tower to form the initial pile adjacent to the rail tracks. Alternatively this chute, as required, will deliver through crushers direct to the retort houses.

An adjacent machinery house contains driving drums to which are attached the ends of a steel cable extending over the storage ground and having a steel scraper attached to it. This scraper is hauled back and forth over the coal, and is quickly detachable, so that it can be reversed when it is desired to reclaim from the pile. Also round the edge of the ground are steel posts to which are attached removable tail blocks, to enable coal to be stored or reclaimed from any position.

In larger installations, however, where from 20,000 to 100,000 tons of coal are stored, a tail block car mounted on rails is used; the car being moved round the outside edge of the storage area to any desired position. When reclaiming coal, the scraper is reversed on the cable, as indicated, and the coal is scraped back to the receiving hopper, whence it is fed by gravity into a skip automatic loader, and elevated to crusher and retort house.

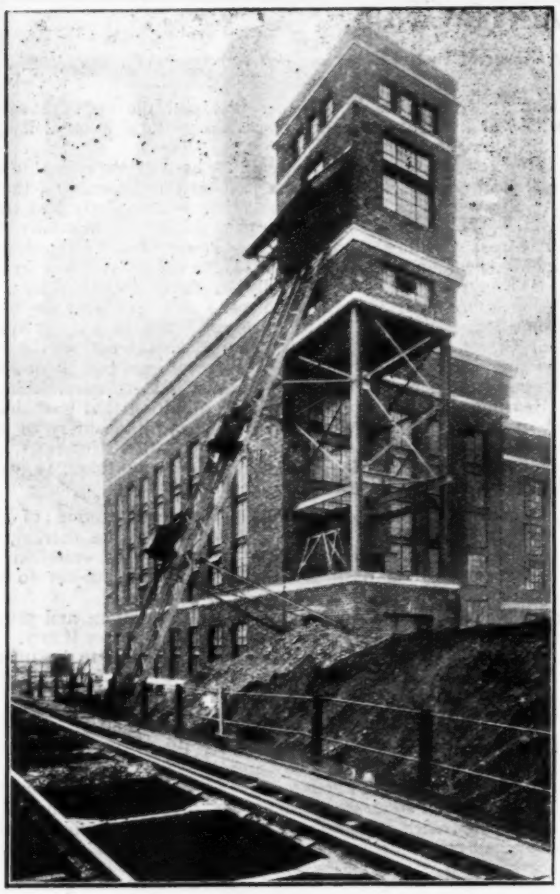
The chief advantages claimed for the system in addition to the one already mentioned are low labour and capital cost, storage in even layers, risk of spontaneous combustion greatly reduced, fire easily fought, equal handling of lump or crushed coal, capacity 20 to 600 tons per hour, and storage up to 150,000 tons.

Typical of the latest practice in this field is an installation of Beaumont equipment now being designed and manufactured at the Derby Works of the Underfeed Stoker Company, Ltd., of London, who, it is understood, have the sole manufacturing and selling rights in the British Empire for the R. H. Beaumont Company of Philadelphia. This is for a well-known gas-works, and is designed for handling 70 tons of run-of-mine coal per hour, arranged also for further extension when more retort houses are installed. The equipment comprises a drag scraper plant and automatic skip hoist feeding direct to the coal store or, alternatively, through a crusher to a belt conveyor feeding No. 1 retort house.

As regards some of the details, the drag scraper bucket is constructed of steel plates suitably stiffened, has a capacity of 2000 lbs. of coal, and is provided with a special swivel pin device for easy reversal on the coupling.

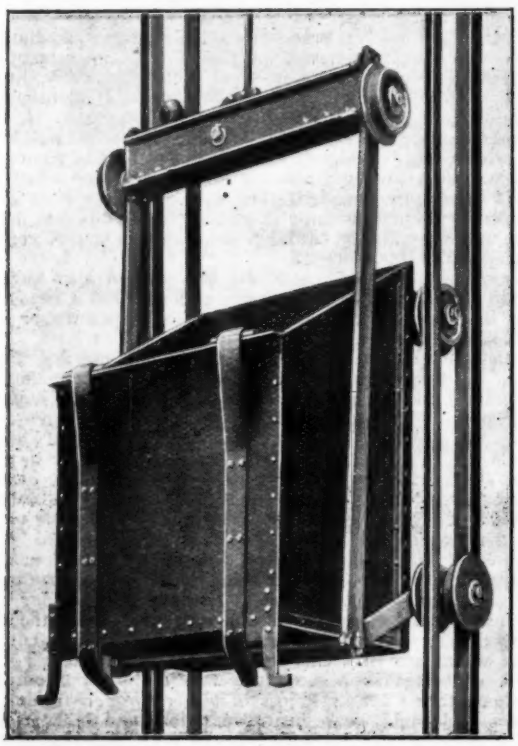
Sharpened tool-steel teeth are provided along the digging edge, and the scraper proper has a rounded back to facilitate travelling back and forth over the pile; and suitable front and back posts with large diameter sheaves having grease gun lubrication are being supplied. Also driving drums of standard design are used; each drum being 27 in. in diameter by 30 in. face, arranged in tandem, and mounted on a heavy cast-iron baseplate. These drums are alternately engaged and released by operating the cone clutches. The tail block car for moving round the coal store consists of a heavy fabricated steel frame mounted on four chilled-iron car wheels; and heavy outriggers are supplied to prevent the car being displaced from the track.

Again, the winding machine is specially designed for heavy continuous service, and is of the spur gear type; the drum being directly connected to the motor by a train of cut spur gears which are fully enclosed and run in an oil bath. The direct connected spur gear type was designed primarily to eliminate thrust bearings, loss of power through friction, excessive and rapid wear, heat generation, and other troubles which are inherent with most types of worm and similar gears when subjected to continuous service.



Beaumont Drag Scraper Conveyor—Typical Skip Hoist Application.

The drum for the skip hoist winder is 30 in. in diameter by 24 in. face, driven by a 30-H.P. motor, operating at a rope speed of 250 ft. per minute, with automatic slow-down to approximately half this speed at the terminal points. There are included shoe type magnetic brake, completely automatic electric control, and slack cable switch. Triple compensating counterweights are supplied for reducing power consumption by smoothing out the power curve.



Beaumont Cable Drag Scraper—Automatic Skip Hoist Bucket.

It may be stated also that one most important feature of this skip hoist is the "Simplex" automatic loader, which is of the "self-damming" type and automatically loads the skip bucket, which is filled at each loading and cannot be flooded or underloaded.

The arrangement is a fixed chute or body bolted direct to the underside of the receiving hopper to which is suspended a pivotted undercut gate opened by the descending skip. Counterweights are attached to the pivotted gate, to assist in closing and keeping it closed; the whole operation being entirely automatic.

The coal breaker, which is of the Norton type, is carried on its own steel tower; the capacity, as stated, being 70 tons per hour crushed down to 2 in. cubes. In operating, the coal for storage is discharged as received into a hopper, elevated by the skip hoist, and discharged to the drag scraper initial pile, or, alternatively, through a crusher feeding an 18-in. belt conveyor running at 300 ft. per minute and feeding No. 1 retort house.

Finally, coal required from storage is reclaimed by the drag scraper to the receiving hopper, automatically fed through the "Simplex" loader, and elevated by the skip hoist to the crusher and retort house.

DOMESTIC WATER HEATING BY GAS.

An instructive evening was spent in the lecture room at the Leamington Priors Gas Company's Showrooms, Regent Street, Leamington, on Monday, March 19, when the Company's employees and others interested in the subject heard an address given by Mr. Adin St. Leger, of the Richmond Gas Stove & Meter Company, Ltd., on the subject of "Gas as Applied to Domestic Water Heating."

The lecturer, with the aid of drawings and actual appliances, described the construction of many of the gas-heated water appliances now in everyday use, bringing out the features of each and the advantages of the particular designs, for special purposes. He enumerated the principal points on which an ideal heater should be constructed, and placed in order the points of importance which should be considered in the construction—namely, maintenance, efficiency, and economy in working.

The Kitchen Range and Back Boiler.

Installation problems of gas water heaters occupied a large part of the address, and the faults of many methods commonly practised were pointed out, and the approved means of installing these appliances given. The lecturer forcefully condemned the old-fashioned kitchen range for water-heating purposes, bringing forward the fact that the usual range did not give a working efficiency of more than about 15 p.ct.—in other words, out of every 100 lbs. of coal put into the grate, useful work was being done by only 15 lbs. of the fuel, the remainder being wasted in the chimney in the form of smoke and deposited as ash and dirt.

The appliances demonstrated included the gas-heated circulator to supplement (or supersede) the coal range; the geyser to supply hot water to baths, &c., and boiling water apparatus for caterers, hotels, church halls, clubs, &c. These indicated the tremendous strides made for combating the smoke and dirt nuisance. Anything accomplished to overcome this is a step forward, and from this standpoint alone gas water heaters offer the greatest possibilities.

Cost of a Hot Bath.

The lecturer went on to say that the question arose "How much does it cost to heat water by gas?" The average cost for a hot bath requiring 20 to 25 gallons of water might be stated as 1½d. to 2½d., depending on the type of appliance. Other features in gas water heaters were the automatic and mechanical devices, which were fitted to control the supply of gas in direct relation to the quantity and temperature of hot water required. Mr. St. Leger emphasized the necessity of fixing pipes of adequate size to ensure the efficient working of the various types of apparatus. He pointed out that, as the gas piping found in many houses was too small to obtain good results, it was usually advisable to run a new and larger gas pipe direct from the meter to the apparatus. He mentioned that gas companies had co-operated with the makers in insisting upon this point when installing apparatus, and he hoped those present would at all times refuse to fix apparatus unless they were allowed at the same time to fix pipes of a sufficient size to ensure the efficient working of the machine. Special precautions had been taken in the construction of gas water heaters to ensure easy cleaning, which was necessary at frequent intervals on account of the character of the water in the different districts. Therefore, in deciding which type of appliance was suitable in a particular district, the nature of the water had always to be ascertained. In the Leamington area the water was "hard," and therefore all appliances should be chosen to allow for easy cleaning and maintenance.

CHEMICAL REACTIONS UNDER HIGH PRESSURES.

A Meeting of the London Section of the Society of Chemical Industry was held at Burlington House on Monday, March 5 (Mr. W. J. A. BUTTERFIELD, M.A., in the chair), at which a paper was read on "Syntheses under High Pressure," by Prof. G. T. Morgan, F.R.S.; Mr. R. Taylor, M.A., B.Sc.; and Mr. T. J. Hedley, A.M.I.Chem.E. The paper dealt with the significance of chemical reactions under high pressures, as indicated in the following résumé of its contents.

By means of photosynthesis—the most important chemical reaction under the sun—green plants are able to assimilate carbon dioxide from the atmosphere, and by subsequent elaborations to convert the simplest carbohydrate, formaldehyde, into such complex substances as the naturally-occurring sugars, the starches, and the celluloses. It is significant that when carbon dioxide or carbon monoxide and hydrogen are compressed together at high temperatures in the presence of suitable catalysts, a synthetic production of formaldehyde occurs, which is followed by the synthesis of complex aldehydes and alcohols.

It may be of general interest to indicate the parts played by pressure, temperature, and the so-called catalyst. For the present purpose it is sufficient to define a catalyst as a substance which can accelerate a chemical change, and to some extent determine the course of this change, without itself undergoing any permanent alteration. For instance, methyl alcohol would be quite a possible product from carbon monoxide and hydrogen under ordinary pressure conditions, providing that a catalyst were available which could accelerate the reaction at a sufficiently low temperature (say, 200° C.). Since, however, the available catalysts are not efficacious at this temperature, the practical course is to work at higher temperatures, and, in the case of chemical changes attended by diminution of volume, to increase the pressure, thus augmenting the yield of the desired product.

In the syntheses described in the paper, Messrs. Morgan, Taylor, and Hedley show that by the use of suitable catalysts composed of various metallic oxides the following products are realizable. In the aldehydic series, acetaldehyde, propionaldehyde, butaldehyde, and higher aldehydes have been identified; whereas among the alcohols they have prepared, in addition to methyl alcohol (wood spirit) as the main product, a notable proportion of ethyl alcohol (wine spirit). Propyl alcohol and isobutyl alcohol have also been isolated, and other homologous alcohols are evidently present. Since these alcohols either occur in plant products or arise by fermentation processes, high-pressure chemical reactions evidently provide a means of imitating certain vegetative processes effected in Nature by the living cell. Methyl alcohol (wood spirit) occurs in the fruits of certain plants, and as its salicylate in oil of winter green. Ethyl alcohol (wine spirit) not only occurs in yeast fermentation, but is present in certain fruits. Propyl alcohol and isobutyl alcohol are both constituents of fusel oil, which arises from the fermentation of protein materials during the manufacture of ordinary alcohol. Isobutyl alcohol is also present as an isobutyrate in oil of camomile.

Though the experiments described in the paper represent a preliminary stage in the work, it is already evident that high-pressure chemistry is likely to prove a valuable aid to chemical industry, and that the scope of these organic syntheses will be increased enormously as further experience is acquired in the complicated technique which is essential in these operations.

INFLUENCE OF FUEL ON INDUSTRIAL COSTS.

A symposium on the subject of the influence of fuel on industrial costs was held by the Institute of Fuel on Wednesday, March 14, in the rooms of the Chemical Society, at Burlington House, Piccadilly, W. 1. The subject was discussed from the points of view of various industries.

Sir PHILIP DAWSON, M.P., who presided, said that one of the principal aims of the Institute was to inform the public of what could be done to make the great asset fuel more valuable to the country. There was much to learn in this country with regard to co-ordination and co-operation between those interested in producing and in utilizing fuel. After a reference to the importance of the electricity supply industry in our national economy, and the part it had played and is still playing in effecting the more efficient utilization of fuel, Sir Philip said the gas industry of this country had also devoted the greatest attention to the problem. The competition between electricity and gas was healthy, and could not injure either industry. Indeed, it would benefit both.

Mr. E. S. SHRAPNELL SMITH, C.B.E. (President of the Commercial Motor Users' Association), dealt with the problem from the point of view of the road transport industry, and referred to the use of coal and coke in steam wagons, &c. The number of such vehicles using coal and coke, he said, did not show very rapid growth at the present time. The fuel mostly used was ordinary steam coal, though some of the steam wagons burned anthracite, and others coke. Owing, however, to the variation in the reactive qualities of the coke obtainable, in the moisture content (due to the methods of quenching), and in the quantity of dust it contained (as the result of the methods by which it was loaded), coke played a small part in road transport except in special cases where certain gas companies took the trouble to grade and clean it properly and exhibited enterprise and energy in bringing it to the notice of the owners of steam wagons. The figures showed that there were less than 10,000 registered heavy steam wagons in this country. It might be that if low-temperature carbonization processes produced a fuel which was capable of being transported without damage, which would be hard and would automatically briquette itself when going through the furnace, and which would have a good reactive surface for firing, the prospects of the steam wagon might be slightly influenced; but he doubted whether that would outweigh the disadvantages connected with the working of the vehicles. He had looked at the products of the low-temperature carbonization plants which were boomed in Stock Exchange circles, but had never found a fuel which one could not crumble in one's hands and which contained less than about 60 p.ct. of dust when transported any distance by rail.*

Prof. K. NEVILLE MOSS, O.B.E., M.Sc. (Mining Dept., Birmingham University), who discussed the matter from the coal mining point of view, said that a good deal of nonsense was being talked about the mining industry and the commodity it produced. On the one hand the public—especially the investing public—was being buoyed up on the false hope that low-temperature carbonization processes would provide not only the means of an early retirement from work for those investing in it, but also the much-needed and elusive palliative for the i"s of the mining industry itself. On the other hand, the public was asked to regard the coal industry as an item of first-rate political importance. Its present position was due far more to political controversy than to inefficiency in its organization and technique. A good deal had of late been said about the inefficiency of coal utilization, and strangely enough this fact had been hurled at the mining industry, which had nothing to do with it. The mechanical engineer, having designed and produced his engine, called for fuel to conform to his specification; whereas it was obviously the duty of the coal industry to point out to the engineer that it produced the cheapest fuel nature could supply, that it mined it as cheaply as conditions would admit, and that it was for him to design his engine to use that fuel efficiently. The cleaning of coal was of the utmost importance to consumers; but it must be recognized that the coal industry only provided what was demanded of it. In this country the consumer favoured lump coal, a fact which increased the difficulty of extraction. In America slack was mainly used. Lump coal had been regarded as a guarantee of purity in itself; but with efficient coal cleaning systems, there was no need to adhere to this. The industry was very anxious to introduce dry coal cleaning processes; but so far such plants were equally as inefficient as wet washing plants in the treatment of coal below ⅜ in., especially if the coal had a fairly high natural moisture content. The idea of buying inferior fuel for pulverized fuel firing was sound, so long as the fuel could be obtained cheaply, because, apart from the small cost per therm, the thermal efficiency of the plant was, within limits, a little higher, owing to the greater radiant heat effect of incandescent ash particles. Further, a high ash content prevented overheating of the refractory furnace linings, though, on the other hand, the disposal of the ash was costly.

*Mr. Shrapnell Smith's experience in this respect must have been narrow.—ED. "G.J."

Discussion.

Mr. JOHN ROBERTS, discussing the question of the use of coke in road transport vehicles, said there were possibilities that this year a satisfactory coke would be made in gas-works which would meet the requirements; but, judging by the behaviour of the fuel in the open grate, the furnaces should be designed to stand a very high temperature. Gas companies could produce a good free-burning fuel, of the nature of a semi-coke.

Mr. E. W. L. NICOL said it might be gathered from the remarks of Mr. Shrapnell Smith that the quality of coke generally left much to be desired. That might be true of coke oven coke, furnace coke, and provincial coke, but it was not true of London coke. [Laughter.] Coke was sold to large consumers in London to a strict specification—*i.e.*, on a calorific value basis—and there was a penalty imposed if the calorific value was below the guaranteed figure. In his experience, that penalty had not yet been incurred. On the other hand, the bonus attaching to an increase in calorific value above the guaranteed figure had more than once been added to the ordinary

selling price. The coke produced in London gave satisfactory results when used in road transport vehicles, and was cheaper than Welsh coal. It was also used in the power stations supplying the tramways and railways of London. Low-grade coals were also blended with coke and used in some of the most efficient power stations in this country.

Mr. A. GROUNDS, dealing with the cleaning of coal, said he did not believe that the dry cleaning table was as efficient as the modern wet washer for coal smaller than ¾ in. The power consumption with dry cleaning plant was very high; and there was constant trouble with dust.

Mr. L. M. JOCKEL (Nottingham Corporation Electricity Works) said he had never been able to buy coal to specification in this country, owing to the attitude of the coal owners, who commenced to raise their prices when buying to specification was suggested. In urging co-operation between the big users of coal—such as the gas and electricity works—and the colliery owners, he pointed to the value of having shift chemists or shift technologists at the collieries to check the quality of the coal leaving the collieries for the various works. There was no doubt this would be of great benefit financially. The gas industry had already made arrangements of that kind in the Newcastle area; and other users of coal would have to do it if the colliery owners did not.

Mr. P. O. ROBERTS said the Metropolitan Water Board were buying coal the calorific value of which was guaranteed; and undoubtedly any large users could buy on similar terms, if they wished.

MANCHESTER AND DISTRICT JUNIOR GAS ASSOCIATION.

Visit to the Works of Messrs. W. C. Holmes & Co., Ltd.

Members of the Association visited the works of Messrs. W. C. Holmes & Co., Ltd., at Huddersfield, on March 21; the day's proceedings beginning with a luncheon at the George Hotel, where the visitors were received by Mr. P. F. Holmes, Mr. D. M. Henshaw, and Mr. F. B. Holmes.

Mr. P. F. HOLMES welcomed the Association; and following the lunch the visitors were conducted to the works, where Messrs. Cooper, Whittell, Hanson, and Watson acted as guides.

The general offices and administrative buildings are situated at the main entrance to the works. The firm was founded in 1850 by the late Mr. W. C. Holmes, the father of the present Governing Director. Following the great exhibition of 1851, a period of industrial expansion took place, and gas lighting was adopted in a large number of provincial towns—so much so, that in a few years over 300 such areas were provided with complete equipment by W. C. Holmes & Co., Ltd., for the manufacture of gas.

In 1872 the firm compiled a book entitled "Instructions for the Management of Gas-Works;" and the visitors were shown this volume. While going through the various departments, the members were shown "Super" type condensers for the Blackpool Corporation Gas Department. Another set of condensers, all of cast-iron, using sea water for cooling, were for the South Brisbane Gas Company, Australia. A Holmes' patent brush washer was examined, and the department where the brushes are made up attracted attention. Liquor coolers, &c., in all stages of construction were examined, and sulphate of ammonia plant for the Cheltenham Gas Company and for Manchester's new Partington Works came in for inspection. Holmes "Western" valves, and die-pressing, and electrical welding of mild-steel specials for gas mains, were noted with interest.

The firm's latest centrifugal washer for ammonia extraction, on order for the South Brisbane Gas Company was seen in operation. Then came the Connersville positive-displacement type of station meter, and the Connersville tandem meter for ordinary consumers' use (capacity up to 20,000 c.ft. of gas per hour). This meter has been inspected, passed and stamped by the Chief Inspector for use as a consumers' meter.

In the works laboratory gas meters after use on saturated and dry town gas were seen. The drawing offices had displayed drawings, models of apparatus, works plant, &c., which enhanced the value of the visit.

Tea was served in the offices; and afterwards the President of the Association, Mr. SMALL, remarked that the visit had been most instructive.

Mr. HAILSTONE (Rochdale) said how interesting it had been to inspect the various parts of plant.

Mr. REYNOLDS (Blackpool) said he had been sent from Blackpool to inspect several parts of the plants that were in the hands of the firm at present, and which would eventually come under the supervision of his Department. He had been most interested in the steel-pressed specials and the new Connersville meter.

Mr. HOLMES expressed his great interest in the gas industry; and Mr. HENSHAW also spoke.

PREVENTION OF ACCIDENTS.

Home Office and National "Safety First" Association Congress.

A largely-attended industrial congress organised by the Home Office and the National "Safety First" Association took place on Tuesday, March 20, under the Chairmanship of Sir Gerald Bellhouse, C.B.E. (H.M. Chief Inspector of Factories). The morning's proceedings, in Caxton Hall, Westminster, were opened by H.R.H. the Duke of York, K.G., after which two papers dealing with "The Value of Safety Work in Industry" were read and discussed. In the afternoon, the delegates met again in the Home Office Industrial Museum, when a further paper was submitted.

SPEECH OF H.R.H. THE DUKE OF YORK.

The DUKE OF YORK, in opening the congress, said: It gives me great pleasure to welcome the delegates to this Industrial Safety Congress. I have always been particularly interested in everything which concerns the welfare of all those engaged in industry; and the safety of the workers must ever be one of the first considerations of those charged with the conduct of industry. To-day's congress is under the joint auspices of the Home Office and the National "Safety First" Association. A similar joint congress was held seven-and-a-half years ago, and since then there has been a fuller realization of the need for, and the value of, organized safety work. But I venture to assert that even now this realization is not sufficiently general; and I hope that, as a result of this congress, a far greater stimulus will be given to this very necessary movement.

Many people are inclined to think of the accident problem in terms of street traffic only. May I remind you that the industrial casualty list is three times as heavy as that of the road; that the number of workers annually compensated is equal to the entire population of a great city such as Leeds? In compensation alone over £6,000,000 are paid yearly; but this figure is only a fraction of the total cost of accidents to industry. Pain and privation to the worker and his dependents cannot be measured in pounds, shillings, and pence. Prevention is better than compensation, and employer and employed have everything to gain and nothing to lose by organized safety work.

THE BULK OF ACCIDENTS ARE AVOIDABLE.

Everyone who has studied the subject knows that the bulk of accidents are avoidable. This afternoon at the Home Office Museum, which I had the privilege of inspecting three weeks ago, you will see how efficient safety devices can render working conditions as safe as humanly possible. Even so, as your Chairman to-day, Sir Gerald Bellhouse, has frequently pointed out, the majority of industrial accidents are not due to lack of proper guarding of machinery, but to failure of the human element. How best to deal with this is the problem with which industry must deal; and it is with this aspect that the National "Safety First" Association, of which I am Patron, is mainly concerned.

There are numerous instances of industrial undertakings, whose names are household words, who can testify to the advantages and success of their voluntary safety organizations. The Great Western Railway, Lever's, Cadbury's, Firth's, Edgar Allen's, and scores of others could be quoted. But there are many who do not, or will not, make accident prevention a sufficiently definite part of their works organization. Your presence here to-day indicates that you are already converted; many of you can instance the excellent results you have obtained. When this congress is over, I hope you will go away determined to help to convert those others.

May I express the hope that industry will look upon both the Home Office and the National "Safety First" Association as their helpers in their respective spheres—ready and anxious to assist in this humanitarian and economic task? In conclusion, may I sum up as follows: Safety work is worth while. Safety work must be taken seriously, and be given a definite place in managerial functions. Safety work is neither a fad nor a stunt. Safety work demands the closest co-operation between all, from the highest paid to the lowest. Safety

work benefits alike employer and employed, and it is a duty which we owe mankind.

VALUE OF "SAFETY FIRST" IN INDUSTRY.

By E. J. Fox, M.I.Mech.E., Managing Director of the Stanton Ironworks Company, Ltd.

In submitting the first paper to the congress, the author explained that his experience was confined to an undertaking occupied in ironstone and limestone quarrying, coal mining, brickmaking, the manufacture of pig iron, and the production of various classes of foundry work—all of them embracing operations which lend themselves to accidents, which only care can help to reduce.

How the Company Deal with Accidents.

For dealing with accidents, the Company have eight fully equipped ambulance houses, manned by twelve hospital trained nurses, working under the supervision of a fully trained lady superintendent. The first of these ambulance houses has now been in every-day operation for the past eight years or so; and while at first the facilities offered were not fully appreciated by the men, there is no question that they do to-day offer services which are much valued by the men themselves, as also by their dependents at home—who are thereby relieved of the attention which previously fell on their shoulders.

Supplementary to these ambulance houses there are installed throughout the different sections of the establishments a series of first aid boxes, under regulations laid down by the Home Office. For instance, at one establishment served by two ambulance houses—both of them open day and night, and in charge of six nurses—there are forty first aid boxes. The members of the Works Ambulance Corps are primarily responsible for having these boxes under their charge, as well as for dealing in the first instance with accidents, and, if necessary, of subsequently rendering what assistance they can to the nurse in charge of the ambulance house. The Company discourage members of the Ambulance Corps, however, redressing wounds from these first aid boxes.

Attached to this part of the organization are outside visitors, whose duty it is to keep in touch with those cases that are unable to present themselves personally for attention at the ambulance house, and to report where, in their opinion, the patient requires help or perhaps is failing to take the necessary steps to place himself in the best position for returning to work. The Company have the assistance of two of the leading surgeons in the Midlands, who between them see every compensation case (with the exception of those at three of the collieries, where the Company, under an old arrangement, do not carry their own insurance), and are available to the men's local panel doctors in a consultative capacity. They also see that the ambulance houses are kept up-to-date in appliances and treatment.

The complete equipment and provision of the larger ambulance houses costs from £750 to £1000 each, and the smaller ones (corrugated iron buildings), with the same equipment, from £300 to £400. The cost of running each ambulance house, excluding lady superintendent and outside visitors, but including nurses, cleaning, surgical stores, &c., is £350 per annum, if open during the day only, and £750 per annum if open day and night.

What the System Has Revealed.

Of about 4000 cases dealt with per month at the eight ambulance houses, about one-third are new ones, many of which in the ordinary way would receive no treatment, and certainly not continued treatment, until they had assumed a more serious condition. The large proportion of small accident cases, not reportable to the Home Office, but each of them a potential danger from the point of view of risk of becoming a more serious case, and consequently entitled to compensation, emphasizes the necessity of reducing the number of accidents by preventative means; and it is this disclosure of facts at the ambulance houses which has prompted the Company to introduce "safety first" methods into their organization. The thorough system of treatment in these ambulance houses has disclosed two things: That the number of accidents requiring to be reported to the Home Office out of the total number of accidents occurring are in the minority, due no doubt partly to the continued treatment enabling the men to remain at work and avoiding more serious development; and that those cases away from work and receiving compensation are enabled, by daily attendance at the ambulance houses, to return to work sooner than would otherwise be the case.

"Safety First" Methods.

After four years' experience of the Company's efforts to minimize accidents by the introduction of "Safety First" methods, Mr. Fox has come to the conclusion that much good can be done in this direction, provided the effort is supported from the top, and that means are taken to enlist the co-operation of the officials—particularly the foremen. Apart altogether from humanitarian considerations, the commercial gains are adequate, in his opinion, to justify the management of a business in providing a small department to deal with this work—preferably under the direct supervision of the general manager or managing director. As the men are in any circumstances the principal losers in case of accident, there should be every desire on their part to co-operate with proposals affecting their safety that may be introduced by their employers; and this desire to co-operate Mr. Fox certainly found to exist.

The Company's "Safety First" organization is supervised by a lady superintendent, under whose directions the ambulance houses are controlled, with a full-time "Safety First" officer as chief assistant. There are advantages in having a connecting-link between the departments dealing with accident cases and with accident prevention. At each of the Company's establishments there is a "Safety First" Committee, including the foremen as a whole and, in some cases, representatives of the men. At the meetings, some half-dozen of the outstanding accidents which have occurred at that particular establishment during the previous month are investigated. Each accident requiring explanation has been previously investigated by the "Safety First" officer as soon as it has occurred; and the six cases to be brought before the Committee are suggested by him. Subsequent to the meeting the minutes are circulated to each member of the Committee, to the Managing Director, and to the principal officials concerned. These embody the recommendations of the Committee for avoiding a similar accident.

Finally, Mr. Fox stated that the comparatively heavy annual cost of maintaining the ambulance houses, "Safety First" organization, and general medical supervision is being met by the savings effected in compensation payments. This is equivalent to saying that these departments are being maintained free of cost for the betterment of the working conditions of the employees and for increasing that goodwill in industry for which both sides to-day are striving.

FURTHER VIEWS AND STATISTICS.

Mr. George A. Isaacs (General Secretary of the National Society of Operative Printers and Assistants) followed with a paper from the workers' point of view. He remarked that there are certain risks which men must take, and included in these are fatigue, monotony, ventilation, unsuitable temperature, bad lighting, and untidiness in the works.

How to Reduce Accidents.

There are numerous ways of bringing home to workpeople ways and means of avoiding accidents; and steps to this end should be taken—not primarily because accidents are expensive, but because they are the means of untold suffering and worry to workers. There is needed an extension of the work of the Home Office, the Industrial Welfare Society, and the "Safety First" Association. Slogans and posters all have their value; but they cannot compare with the personal influence of a sensible welfare superviser, no matter what his title or description. Welfare work brings improved workshop conditions, diminished sickness, increased freshness at work, and leads to a spirit of contentment that is bound to have an influence on the risk of accident. It is beyond question that the vigilance of the factory inspector and the splendid work of the Industrial Welfare Society and the "Safety First" Association have produced excellent results; but the best step towards accident prevention is co-operation between the organizations of employers and employed.

Universal Voluntary Effort Essential.

The Home Secretary (the Rt. Hon. Sir William Joynson-Hicks, Bart.), who is President of the National "Safety First" Association, was unable to be present; but in a letter of regret he said: "I have always emphasized that the most satisfactory results in this, as in other spheres, are those which are obtained by voluntary effort, rather than by compulsion. But a genuine and universal voluntary effort must be forthcoming. It is not sufficient that many of the bigger and more progressive industrial undertakings should realize the humanitarian and very definite economic advantages of making organized work for the prevention of accidents a definite function of scientific management. This knowledge must become universal. We, as a nation, cannot afford the wastage of life, limb, time, and money which accidents entail. The provision of safety devices alone will not eliminate accidents, and is not the sole duty imposed on employers. They should also carry with them the operatives in a common determination to achieve the highest possible measure of safety."

South Metropolitan Gas Company's Practice.

Mr. R. C. Macdonald, who took part in the discussion, said that the South Metropolitan Gas Company offer every encouragement and facility to men and women in their employ to become proficient in ambulance work; and it is a condition that every man who occupies the position of foreman must possess a good knowledge of it. The appointment of a Committee to investigate some of the accidents, as described by Mr. Fox, while undoubtedly a move in the right direction, is only one of the first steps. There is a great deal to be gained by an investigation of every accident, as is the practice of the South Metropolitan Gas Company. One of the advantages of their "jury system" is that workmen serve in rotation on the juries, and by this means all the men are kept in touch with the work of accident prevention. This plan has been successfully followed by the Company for a great many years. Mr. Isaacs spoke sound sense when he declared that co-operation between workers and employers is the only method by which one can hope to eliminate accidents.

SCOTTISH JUNIOR GAS ASSOCIATION (WESTERN DISTRICT).

The last ordinary meeting of the session took place in the Royal Technical College, Glasgow, on Saturday, March 10, at which Mr. ROBERT FIFE (Kilmarnock), the President, was in the chair.

The PRESIDENT called attention to the alteration in the arrangements for the annual general meeting, which will now take place on Saturday, March 31, in the Grand Hotel, Charing Cross, Glasgow, when the speaker will be Mr. W. M. Mason (Manager of the "B.C.G.A.").

THE UNIFICATION OF GAS UNDERTAKINGS, OR CENTRALIZATION.

By ALEXANDER MCDONALD, B.Sc., A.I.C., of Motherwell.

In the first portion of his paper, the author went fully into the economy and efficiency in working which unification offers; and in the second part, which is reproduced below, he gave many interesting particulars with regard to the scheme of this nature which has been adopted at Motherwell.

Some detail as to how the position was viewed at Motherwell and Wishaw when unification was adopted might be interesting. The plant generally at Motherwell was in good condition, but the exhausting machinery required attention, and the purifiers immediate renewal. Tar and liquor storage was inadequate, while no railway transport facilities were available.

The Wishaw Works were by no means in a happy position. Repairs and renewals to the carbonizing plant were long overdue, while the scrubbers, and particularly the purifiers, were responsible for no little anxiety. The works has ample railway siding accommodation. In order to avoid capital expenditure at the Wishaw Works the distribution systems were linked up in 1920, so that Motherwell was able to supply gas to part of the Wishaw area.

REQUIREMENTS.

About two years ago, considerable renewals became a necessity, while a railway siding for Motherwell was urgently required. Accordingly, when all the requirements were considered, the advantages of unification became obvious. The first task was to draw up the needs if the works were to be run as separate units, and also if centralization were adopted. Table I. gives a summary of the complete requirements as they were ultimately conceived.

TABLE I.—*Summary of Plant Requirements.*

At Motherwell.	At Wishaw.	Centralization.
..	Retorts	Transfer retorts
..	Condensers	,, condensers
Exhauster	..	Exhauster
Purifiers	Purifier valves	Purifiers
..	Scrubber	Transfer Livesey washer
Liquor storage	..	Liquor storage
Tar ,,	..	Tar ,,
..	Boiler	..
..	Lift to holder	..
Coke handling	..	Coke handling
S/A plant	..	S/A plant
Tar ,,	..	Tar ,,
Railway siding	..	Railway siding
..	..	H.P. mains, &c.

This table, then, brings out the fact that by unification several items of plant, such as purifiers, railway siding, &c., are practically the same as for separate units. Again, none of the Wishaw requirements would be necessary. In order to supply the extra plant required at Motherwell, the simple transference of some of the Wishaw plant would be adequate. Thus the condensers, Livesey washer, &c., are in perfectly good condition; and these would be ample to meet the needs of such a scheme.

In considering retort plant it had to be borne in mind that the Wishaw plant was erected only ten years ago, and beyond the overhaul and rebuilding of the retorts, little alteration was necessary. The idea of entirely scrapping it and building a completely new bench seemed preposterous. The contractors were therefore approached, and the position was explained. After due consideration of the nature of the work involved, they undertook to transfer the plant and at the same time to instal the latest type of retort as part of the scheme. They submitted an estimate for this work, which, together with an estimate for reconditioning it *in situ*, was duly considered. Finally the lay-out was drawn up.

COSTS.

The next step was to tabulate the estimated capital expenditure. Table II. gives a summary of the estimated costs.

The question then amounted to this: Which of these alternative schemes will be the most economical, and ultimately of greatest advantage?

TABLE II.—*Summary of Estimated Costs.*

—	Motherwell.	Wishaw.	Unification.
	£	£	£
Carbonizing plant. . . .	..	3,000	13,500
Purifying plant, &c. . . .	11,750	8,550	10,250
Distribution	..	..	6,000
Railway	9,200	..	9,200
S/A and tar plants . . .	6,500	..	6,500
	£27,450	£11,550	£45,450

Excess cost of centralization over separate units, £6450.

GAINS.

By computing the gains under each scheme, a "balance-sheet" was prepared. Estimation of the savings presented several obstacles. Ultimately, it was decided to base the figures on a three years' average. Thus, in obtaining the saving on manufacture, the average of the previous three years' costs at both works was drawn up. Then the working costs under unification were estimated. The difference between these gave the "gain on manufacture." To this fell to be added the saving on cost of coal, since the net cost at Motherwell was fully 2d. less than that at Wishaw. In this way, the "Gain on Manufacture and Coal" was obtained, and will be found summarized in Table III.

TABLE III.—*Gain on Manufacture and Coal.*

	£ s. d.	£ s. d.
Manufacturing costs at Motherwell . .	6610 0 0	
,, ,, Wishaw . .	4773 0 0	
		11,383 0 0
,, ,, under unification .		8,151 0 0
Gain on manufacture		3,232 0 0
Add net saving on cost of coal . . .		986 0 0
Gain on manufacture and coal . . .		£4,218 0 0

Under centralization, the equivalent of the Wishaw liquor, formerly sold crude, would be treated at Motherwell, thus augmenting the income by 0·80d. per 1000 c.ft. This meant an increased profit of £417 annually. At the same time a Grade I. sulphate would be manufactured, thus realizing a further gain of approximately £400—a total of £817. Without unification, however, Motherwell alone would produce a Grade I. sulphate, and the gain effected would then be £277. It must be remembered that two years have elapsed since these figures were estimated.

The necessity of railway siding accommodation at Motherwell, whichever scheme was to be adopted, was obvious. The advantages were further enhanced by centralization. Mention has already been made of the cost of installing a suitable railway siding, including the purchase of land, a locomotive, gantry, and tipping plant in the coal store, &c., amounting to £9200. This siding would effect a saving of £1160 annually by the elimination of cartage on coal, char, sulphate, tar, &c. This saving would be increased to £1890 if unification were adopted. These figures made due allowance for all working expenses. At the same time, a decided advantage to be gained was that of having a check on all weights, whereas at the time colliery and other weights had to be acknowledged. There was also a considerable amount of loss in cartage which would be avoided. No accurate pecuniary value could be put on these two advantages.

A tar dehydration plant also came under review. Storage for this plant could be obtained by utilizing a disused gasholder tank of about 350,000 gallons capacity, or about six weeks for both tar and liquor, or 200 days if used for tar alone. It was estimated that, by the introduction of such a plant, an increased profit of about £1750 could be obtained on the Motherwell tar. By unification, these profits could be further augmented by another £1000, or a total of £2750.

The gains procurable by the introduction of each item having been worked out, the preparation of the "balance-sheet" was proceeded with. Several deductions were made from the gain on manufacture and coal (see Table III.) to allow for the retention of old servants whose services in their present capacities would not be required. Such a "balance-sheet" is given in Table IV.

TABLE IV.—*Balance-Sheet.*

—	Separate Units.	Unification.
	£	£
Total cost of scheme (as per Table II.).	39,000	45,450
Gain on manufacture and coal (after deduction)	..	3,550
Gain on railway.	1,160	1,890
Gain on S/A plant	277	800
Gain on tar plant	1,750	2,750
Total gain	£3,107	£8,990
Deduct burdens on capital	2,925	3,409
Net annual gain	£272	£5,581

Any doubts as to which scheme would be the more advantageous vanished when this table had been drawn up. By unification, the substantial balance of £5500, which meant about 3½d. per 1000 c.ft., could be passed on to the consumer. By continuing as separate units, this balance was only £250. In both instances, the capital charges were covered, but in the latter case it entailed the adoption of the entire scheme.

One could not expect to obtain those benefits immediately in their entirety. Care, however, had been taken in estimating both costs and gains, so that we are satisfied they will be ultimately obtained.

The Motherwell plant was thoroughly overhauled; repairs and alterations being carried out where necessary. By this means, Motherwell was put in a position to cope with the combined demand whenever the winter peak was over; and the Wishaw Works were closed down.

Before the cessation of manufacturing operations at Wishaw, the distribution had to be put in order. It was decided to retain the Wishaw holders as a supply station. These are filled by high-pressure gas from Motherwell. For this purpose, it became necessary to lay four miles of 8-in. steel main. Long sleeve welded joints were adopted, and a Bryan-Donkin reciprocating compressor was installed. All the work in this connection, except the welding, was carried out by works labour.

Prior to the winter months, all preparations for the coming transference were put in hand. The foundations for the retort bench were laid down, and such parts of the Wishaw plant as could be dismantled were taken down. It was thus made possible to speed up the actual transference of the retort plant, so as to have it ready for the following winter. In transferring, opportunity was taken to put in a larger retort of the latest type, and provision was made for further extensions. The new house thus gives accommodation for a retort plant capable of 1¾ million c.ft. per day—an increase of 38 p.ct. on its old capacity.

I think I have made it clear that, given certain conditions, centralization is of extreme advantage to the gas-consuming public. Even if these conditions are not available, it has many benefits over our present "small unit" system.

Discussion.

Mr. R. FIFE (Kilmarnock) complimented Mr. McDonald on his interesting and lucid paper. It would be found in most areas that, to effect centralization, many private undertakings would require to be bought at a prohibitive price; and in many cases mains, services, and meters would require renewing. It would probably be found cheaper to introduce gas into villages where no supply existed hitherto. Many of the advantages propounded by Mr. McDonald would no doubt accrue in the course of time.

Mr. R. KEILLOR (Greenock) said Mr. McDonald had given a very complete paper on unification, and had made out a splendid case. He also spoke of the purchase price of smaller works in rural districts, which in many cases would be very high. This, of course, was not experienced in the Motherwell-Wishaw instance. The principle, he thought, was good, but could be carried too far.

Mr. D. MELVIN (Uddingston) also congratulated Mr. McDonald on his interesting address. In the Middle Ward of Lanark nine works had amalgamated, and only two were now manufacturing stations. One important point to keep in mind was the money spent in local rates. Assessments as rates paid for works which were scrapped were approximately the same as for those in operation. This should be taken up strongly by the gas industry.

Mr. W. CALDERHEAD (Stonehouse) pointed out that on amalgamation taking place in the Middle Ward of Lanark, the calorific value was dropped from 500 to 425 B.Th.U. This caused no difficulty with the mains and services, but trouble was experienced with cookers. The length of high-pressure mains in the area of Lanark was 11 miles. Amalgamation for the sake of amalgamation was of no value. Unless it gave cheaper gas to consumers, it was not worth while.

Mr. J. CUBIE (Glasgow) also thanked Mr. McDonald for his paper.

Mr. MCDONALD replied to points that had been raised; and on the motion of the PRESIDENT, he was warmly thanked for his contribution.

SCOTTISH JUNIOR GAS ASSOCIATION (EASTERN DISTRICT).

A Meeting of the Association was held at Cupar, Fife, on March 17. In the early part of the day about twenty members proceeded to the course of the Cupar Golf Club, and engaged in competition, prizes for which were provided by Messrs. White, Milne, & Co., of Dundee, and Mr. James MacPherson, the Gas Manager at Cupar.

Mr. Henry Rule (Kelty) secured the scratch prize, and Messrs. J. Stevens (Ely), R. L. Laing (Brechin), 1st and 2nd handicap, while Messrs. Geo. Brown (Kirkcaldy) and P. Blackhall (Edinburgh) tied for 3rd.

At 2.30 p.m. the visitors were met at the gas-works, and welcomed by Sheriff Stark, the Chairman, and Mr. MacPherson, and afterwards were conducted in parties over the works.

GAS PLANT AT CUPAR.

Commencing at the retort house, where there is a "W-D" plant, the visitors first examined the overhead storage hoppers, which have a capacity of 54 hours' supply. The plant was started in February of 1916, and since then, up to March 1 of this year, the quantity of gas made has been 503 millions. The working results for the last ten months from May, 1927, were given as:

Gas made	44,703,000 c.ft.
Make per ton	20,435 ,, (400 C.V.)
Coke ,,	11¾ cwt.
Coke used per ton	5½ ,,
Tar per ton	19·27 galls.

The cost per 1000 c.ft. from coal store to coke yard was 2·11d.

Despite the fact that the retorts have been in use for over twelve years, no new bricks and no repairs other than re-pointing have been required. The producer, after nine years, was relined, and in addition required three sets of bars and two sets of drip plates. Five new curved discharger doors were used. Also new ropes to the lift were fitted in 1921, those used up to that time being war ropes and rather inferior. The present set, however, look fit for some years yet. These are the only repairs done to the plant since it was started, at a cost of just over £50, including all the ironwork.

It is the practice in Cupar to remove one mouthpiece every year, and to point the retorts once each year with "Flexo," afterwards painting them over in an effort to put a skin on them. Pricking is carried out once in 24 hours, clinkering once each week, and scurfing every 14 to 16 weeks.

All ashes are riddled, and last year they obtained from this source 66 tons of coke and 52 tons of clinker. Mention was made of the coal being rather bad, due to the coal stoppage, but for which more desirable results would have accrued. For the past ten months the coke picked was 43 tons, and the clinker 26 tons.

Over the last ten months the monthly makes and costs, as mentioned by Mr. MacPherson, were:

—	Average per Day.	Average per Man per Day.	Wages per Day.	Average Make per Man for May to October.
May	106,200	53,100		
June	93,600	46,800		
July	103,200	51,600	23s. 6d.	53,800
Aug.	107,200	53,600		
Sept.	128,300	64,300		
Oct.	154,600	51,700		
Nov.	192,000	64,000		October to March,
Dec.	210,800	70,200	28s. 1d.	61,800
Jan.	195,200	65,000		
Feb.	174,400	58,100		

An arrangement of chains and wires connected to the pulleys on the auxiliary hoppers, and led down to the discharging floor, by which anyone on the ground floor may see exactly how the retorts are running without having to travel to the top of the beds, was much admired by the visitors. The superheating arrangement was explained in detail. Steam from 30 lbs. up to a maximum of 42 lbs. is supplied to the retort; this being altered according to the throughput.

The pressure-wave plant for the public lighting system was examined, and the guides explained that a wave from 40-tenths to 60-tenths for three minutes was applied, and during every operation the town lamp attendant was present to see that the requisite increment was applied.

In turn the following units were seen: Annular condensers, Livesey washer, water-lute purifiers, and Bryan-Donkin exhauster of 20,000 c.ft. capacity, with, as a stand-by, a Waller 15,000 c.ft.

Following the tour of the plant, the visitors adjourned to the Royal Hotel, where tea was provided.

Sheriff STARK expressed his pleasure at seeing so many men in the industry coming to examine their works, of which he and his Directors were very proud. Their plant, which had worked so economically, had in every way fulfilled the promises made regarding its capacity. The step taken had never been regretted, and was due to the foresight, splendid judgment, and speculative spirit of the Manager, Mr. MacPherson. He wondered where his Company would have been now with the old system against the present-day demands. Applications for cookers, &c., had gone up considerably, and were growing.

Mr. W. HONEYMOON, a Director of the Company, and Captain of the Golf Club, then presented the prizes to the winning golfers.

Afterwards Mr. E. L. FARQUHAR (President) called on Mr. Hounam to read his paperette (submitted in competition) on

"Modern Governors." The speaker had with him several blue and white prints of the apparatus he described, and these were distributed among the audience. A large line drawing also showed the members some of the points in regard to loading by compressed air.

MODERN GOVERNORS.

By A. Hounam, of Edinburgh.

In these times of modern methods and efficient gas making, the accurate control of pressure has become a most important matter; and the gas governor, which, I think you will agree, forms an important link in the chain of gas-works plant, has had to keep in line. Though the principles underlying the functioning of these pressure-controlling devices have changed but little, many improvements have been made.

The Retort House Governor.

Starting with the retort house governor, I think it must be admitted that, for the size of foul main to which it is fitted, it is bulky and cumbersome. Though reliable up to a point, where present-day requirements are to be coped with, it leaves something to be desired. If the ordinary retort house governor maintained level gauge, or 1 to 2 tenths vacuum to within 1 tenth W.G., it was doing well; nowadays it is sometimes asked to control to within $\frac{1}{10}$ in. or $\frac{1}{50}$ in. W.G. The ordinary retort house governor will definitely not do this. The inertia of its heavy moving parts rules it out for such accurate control. The great weight of its cast-iron valve, large bell, and consequently heavy counterbalance weights—to say nothing of friction caused by tarry deposits—calls for at least 1-tenth vacuum to move them one way or the other. Its failing lies in the fact that it depends directly on a change of vacuum to move its cumbersome moving parts.

The tendency to-day is to employ some outside power controlled by a sensitive relay to operate a balanced valve usually of the butterfly or throttle type. A sensitive relay is operated by the slightest change in vacuum in the foul main—even $\frac{1}{100}$ in. W.G.—which, in turn, controls some outside power such as water pressure, oil under pressure, or compressed air; this outside power doing the work of opening and closing the actual governor valve.

There are several makes of this type of governor in use, such as the "Arca," operated by water pressure, the "Askania," operated by oil (a clever governor, I think of German origin), and the "B.V.R." made by Messrs. Peebles & Co. Of these, the latter is the only one I can describe with accuracy.

The "B.V.R." Governor.

It is operated by compressed air or high-pressure gas, and consists of a butterfly valve placed in the foul main (vertical or horizontal) occupying a space of only a few inches. The spindle of the valve protrudes from the valve body and is attached by links to the end of a piston-rod and piston; the latter working in a double-acting cylinder exactly like that of a steam engine, but without a steam chest.

The relay consists of a small circular seal-pot having two concentric chambers containing thin oil, the outer chamber being enclosed and connected by a small pipe to the foul main somewhere between the butterfly valve and the retorts. In the inner chamber of the oil seal box a cork float is placed to which is attached a tiny lever operating a button valve between two nipples. These two nipples are directly opposed to one another, exactly like the carbons in an arc-lamp. Both are connected to the compressed air supply, and each to an end of the working cylinder.

The slightest rise or fall of the oil in the float chamber brought about by changes of vacuum in the foul main (to which it is connected) will cause the cork to rise or fall. This causes the button valve to close or partly to close one nipple and open the other, thus admitting compressed air to one end of the piston, and allowing it to escape from the other. Thus—herein lies the great advantage of this type of governor—with air pressure at (say) 5 lbs. per sq. in. and a piston of 4-in. diameter, we have a power of 60 lbs. to move the throttle valve, and this 60 lbs. controlled by $\frac{1}{40}$ in. or $\frac{1}{50}$ in. water pressure.

When high-pressure gas is used, the nipples are enclosed in a gas-tight chamber from which a pipe may be taken back to the foul main or into an adjacent low-pressure main, thus eliminating any waste of gas. This type of regulator may be used also for conditions of pressure instead of vacuum, or as a by-pass governor.

The Station Governor.

Next comes the station governor, which does what it is designed to do, but no more. A good average pressure in the district is what is wanted, without having to alter the pressure at the works every now and then. This condition is obtained by the self-loading station governor; but to go into all the details as to how this is accomplished would more than take up the time available. A full and well illustrated description of this governor was given in the "Gas Journal" for Oct. 5, 1927, p. 43—a paper read at Cambridge to the Eastern Counties Gas Managers' Association by Lieut.-Col. W. C. Peebles.

Gas Loading.

Gas loading is not new. In fact, a perfect governor loaded by gas was invented by the late Mr. D. Bruce Peebles in 1875. However, it seems to have been much before its time, for even to-day its advantages, though they may be fully realized, seem to be disregarded. It is with the object of dispelling any doubt that I describe the following experiment.

Curiously enough the greatest difficulty—if difficulty it was—with gas loading was in getting the governor to unload when it was required to do so. A standard 12-in. constant-pressure governor of the enclosed type, with its usual beam and counterbalance, was used; the spindle being brought through a mercury seal-pot fixed on the top cover, thus making the chamber above the bell absolutely gas-tight. A small ordinary mercurial service governor (which incidentally is a very efficient non-return valve) was mounted on the top cover of the main governor; its inlet being connected to the inlet main feeding the large governor. The outlet of the small loading governor was led through the top cover into the gas-tight chamber above the main bell, and a third connection through a needle valve was made between this chamber and the outlet of the main governor. A through connection was thus established between the inlet and the outlet of the main governor via the loading governor. The weight of the main governor bell and valves was now accurately balanced, so that they remained in any position they were placed by movement of the beam. Now comes an important point in the assembly of the governor.

A weight equivalent to 2-tenths pressure on the main governor was placed on the counterbalance arm, thus overbalancing the bell and valves by that amount, and causing the valves to close.

With an inlet pressure varying from 6 in. to 15 in., it was decided to load the governor to give (say) 4 in. outlet. The small governor was accordingly loaded till the required outlet was obtained at the main governor outlet, but it was observed that to obtain this 4 in. it was necessary to load the small governor to give 4 in. *plus* the 2-tenths by which the main bell was overbalanced. To obtain 5 in. outlet from the main governor, 5 in. *plus* 2-tenths was required above the main bell, and so on. The slight overbalancing of the main bell and valves brought about the desired condition of always having a slightly higher pressure above the main bell than obtained at the outlet of the main governor. This condition enabled the loading gas always to find an outlet into the outlet main.

This governor did unload as rapidly as it loaded. The cycle of operations is perfect, being merely a series of physical laws operating in natural sequence. When the demand for gas increased, a momentary drop in pressure allowed the main bell and valves to open; the space vacated above the bell being immediately filled up by gas at the correct pressure from the loading governor. When the demand decreased, a momentary rise of pressure raised the main bell and valves, tending to compress the gas above the bell. This caused the loading governor valve to close (being a non-return valve). The remaining gas, being maintained by compression at a slightly higher pressure than that at the outlet of the main governor, found its way thence, thus completing the cycle.

The advantages of gas loading are most appreciated in large governors. With a bell (say) 36 in. in diameter it would be necessary to handle about 40 lbs. of weights for every inch of increase required, and then handle again for a decrease. With gas loading, a weight of a few ounces will make a change of 2 in., if necessary. Then, owing to the pressures on the inside and outside of the bell being practically the same, a very small seal is all that is necessary for the bell, thus keeping down the size of the tank. In fact, where high outlet pressures are required, gas loading is the most practical solution, and it also can be arranged for self-loading.

Discussion.

Mr. Farquhar remarked that modern requirements of finely adjusted vacuum had brought in their train the need for sensitive and reliable retort house governors. Happily the manufacturers had supplied the need. The efficient working of the governor to 1-tenth of an inch represents a high degree of sensitiveness, and must have called for considerable ingenuity and patient experiment before the present apparatus was evolved. Mr. Hounam's description of the latest in station governors was full of interest; and though for some of them the old system met all their needs efficiently, at the same time it was essential that they should keep in touch with improvements. It was interesting to recall that the station governor was the first type of governor used in gas-works.

Mr. Richmond (Penicuik) said there was no doubt about the advance made in governors of all types, though the evolution had in itself not altered greatly the method of working. He considered that in small works where no compressed air was available, the costs of introducing this type of control for retort house governors would mitigate against its adoption.

Mr. Hounam observed that the demand for governors had increased greatly, especially so for large sizes. This increase was bound to continue so long as the increasing use of gas continued. In earlier days, their maximum pressure was in the region of 10 in. Now

it was up to 10 lbs. per sq. in. The high-pressure governor, he believed, would be the thing of the future, and would permit the retention of the ofttimes small mains in the ground, working under higher pressures into reducing governors. In regard to the compressed air operated types, he said the manufacturers could supply the whole plant.

USE AND ECONOMY OF A SOOT BLOWER.

By JOHN SCOBIE, of Dunfermline.

[This paperette was also submitted in competition.]

Fuel used in gas-works boilers is, as far as possible, limited to coke breeze. Dunfermline, like other works, has been using this fuel mixed with coal dross, and the boiler to which I refer is of the Lancashire type, 30 ft. by 9 ft., fitted with Crosthwaite forced-draught furnace and having a working pressure of 100 lbs. per sq. in. When firing with coke breeze and dross, trouble was experienced through the flues rapidly filling up with dust, and in a few weeks after cleaning there was little space left for the flue gases. Consequently it was necessary to have the forced draught working at full pressure, in order to generate sufficient steam. Owing to this increased blast, dust was carried forward to the base of the chimney and even emitted from the top, and this dust gathered in such quantities that it was found necessary, in order to maintain steam pressure, to clean out the base of the chimney frequently. The defects of this system may be summarized as follows:

(1) Lower efficiency of the boiler.
(2) More coal used in order to have an adequate pressure of steam.
(3) Forced draught always in use, at full pressure, entailing high consumption of steam.
(4) Flues and chimney filled with dust, the chimney requiring to be emptied periodically.
(5) The emission of dust from the chimney, this dust being blown into skews, flashings, and slates of adjoining roofs, causing leakage by "creeping," and also serious damage to roofing. In our case rones, cesspools, and at times drains, became choked.

When a gas-works is surrounded by other works or by dwelling-houses, the emission of dust must be considered a nuisance; and in view of the claim of the gas industry that the manufacture of gas can be carried out without smoke or dust, every possible step must be taken to obviate complaints.

In our case, the works are, happily, situated entirely free from surrounding property, but the damage to our own property was sufficiently serious to compel us to find a remedy. Fortunately an apparatus was found which served the double purpose of obviating all nuisance from dust, and enabling higher efficiency to be obtained from the boiler. This apparatus consists of a series of steam pipes and blowers, the latter being of special metal, and having jets fitted in such a position that, when steam is turned on, the dust is blown forward from the various flues to a brick-built dust collector. This consists of chambers in which are fitted baffle walls and water sprays. In the outer wall of this chamber is an air-tight door of a suitable size and in a convenient position for removing the deposited dust.

The steam jets are in such a position that when the blower is in action, dust and soot from all the flues are carried forward to the collector. When this is put into action, dust is blown from the main flue up an inclined plane to the dust collector, and, meeting the first baffle, extending from the top, strikes this, and is deflected downwards. In passing under this baffle the dust and soot are drenched by a spray of water and steam, and owing to the deflection given by the baffle wall are driven downwards on to the sloping cement floor. The gases now travel over another baffle extending from the bottom upwards, and are there drenched by a second spray before passing to the chimney. The "blow" to the various flues is controlled by one patent manifold valve having six numbers on the valve wheel, which indicate that portion of the flues to which the blow is being directed. Our method of working is as follows:

Water is turned on to the spraying system. The manifold valve is first opened so as to introduce the blow for about ten seconds to each of the side flues (this being where most dust collects), and so providing a clear passage for dust following from the other flues. The valve is then closed. By turning the valve to various positions consecutively, and giving approximately ten seconds' blow at each, the dust is driven from the fire-tubes through the various flues to the dust collector. The dust collected on the sloping concrete floor of the collector is removed by hand every 24 hours; the time occupied in doing so being about five minutes. The process of cleaning the flues is carried out once per 8 hours, though with certain fuels the period could be extended.

The results from the working of the apparatus have been very satisfactory. On commencing the system, as much as a cart-load of flue dust was taken from the collecting chamber each day, but by improved methods of working this has now been reduced to from one to two barrow-loads, which can be accounted for by the fact that, owing to the flues being entirely free from dust, it is now possible for the boilermen to use little or no blast on the fires.

The advantages of the apparatus may be summarized as follows:

(1) Flues entirely free from dust.
(2) Much less blast required on fires.
(3) It is not now necessary to remove dust from base of chimney. (During October this was found necessary on three occasions.)
(4) Fires require less cleaning, and the work is much easier. (Boilermen now clean the fires twice, whereas it used to be necessary to do so three and, on rare occasions, four times per 8-hour shift.)
(5) Less coal required. Percentage of coal has been cut by half. Therefore a much larger proportion of coke breeze is used for firing.
(6) No dust emitted from chimney.
(7) When boiler is shut down for inspection, &c., no time is wasted, or expense incurred, in cleaning flues
(8) More regular steam pressure.
(9) Greater efficiency of boiler.

While the question of cost and return is, of course, one of the first considerations in any system, I am sure you will agree that the above advantages in themselves deserve very careful consideration. The total cost of the plant in our case was approximately £200. The following gives the amount of fuel used and water evaporated for one month prior to, and one month after, installing the soot blower:

Month Ended—	Fuel Used.			Total Tons.	Total Cost.	Water Evaporated from and at 212° Fahr.				
	Coals, Tons.	Coke, Tons.	Breeze, Tons.			Water, Galls.	Per Lb. of Fuel, Lbs.	Per Hour, Lbs.	Cost per 1000 Galls., Evaporated.	P.Ct. Coal to Total Fuel.
					£ s. d.				s. d.	
Nov. 15, 1927 (30 days)	218	20	167	405	203 1 3	477,480	5·26	5631	8 6	53·7
Jan., 1928 (26 days)	56	4	209	269	127 11 3	449,570	7·46	7204	5 8	20·9

Discussion.

The PRESIDENT remarked that the Dunfermline undertaking was to be congratulated on the results obtained from the installation of the soot blower described in the paperette. Apart altogether from the desirable attainment of smoke abolition, the installation of an appliance which reduced the cost of water evaporated by 2s. 10d. per 1000 gallons certainly merited the initial expense. He asked if £200 represented all the costs, including the actual building-in. He said he would like to know how the tests were carried out, and the arrangements made for noting fuel consumption. It would be interesting to hear if the proportion of fuel used during January was the result of experiences with various quantities of coal dross, coke, and breeze, and whether any experiment had been made with coke breeze alone. He also asked if the dust chambers were built overhead, to facilitate cartage.

Mr. RICHMOND said he was surprised to learn of the great saving effected by such a simple apparatus. He asked if the spray and baffle arrangement tended to create back-pressure in the boiler flues.

Mr. MACPHERSON thought the apparatus described was an excellent one. He asked if any superheating arrangement was employed. He himself had used exhaust steam for superheating, with splendid results. How was the boiler insurance affected?

Mr. D. GARRIE (Burntisland) considered this an admirable system for boilers rather small for their work. He asked why special metal had to be used for the blowers.

Mr. A. W. FARQUHAR (Leven) asked if the blow and spray had any ill-effect on the flues, and if the price paid for water was high, as this too would influence the costs.

Mr. SCOBIE then replied to the points raised. Breeze, he said, was now being used. No back-pressure whatever was experienced, and they used a very small spray. In regard to superheating, they had a scrubber and another engine in use for this, and it was their purpose later to connect up all the engines in this way. No objection had been raised in regard to the boiler insurance, but whether the authorities were in agreement with the scheme he could not say at present. Some special metal was essential. Even with the "W-D" plant, ordinary metal was found to deteriorate quickly in the flues. The dust doors were placed conveniently for removing the collection at the baffles. Up to the present there had been no ill-effects. A slight crack had developed in the dust collector, but this was readily pointed up again. The price paid for water was fair compared with other towns in the vicinity.

The proceedings terminated with a vote of thanks to the authors for their interesting contributions.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

"Le Fleuve" Method of Coke Transference from the Hot to the Quenched State.

SIR,—I notice in your columns a reference to "Le Fleuve" as a method of transferring the hot coke of the retort house as quenched coke to the store hoppers.

As the person first responsible for the introduction of "Le Fleuve" to the gas-works of this country, I feel a certain onus in the matter, having regard to some statements which are now being circulated; and I should be obliged therefore if you would allow me to state the following facts.

"Le Fleuve" was originally brought to my notice by a report made by the Chief of the Rouen Works of the European Gas Company (of which I am Chairman) some five years ago. We were told it had been operating at other places in France for some time, and as a result decided to adopt it.

I saw the arrangement working at Rouen in the spring of 1925, and so impressed was I with its capabilities that I determined to put it in on a large scale at our Old Kent Road Works. The pumps and settling tanks were constructed for four retort houses, but, owing mainly to delay in getting steel-work, we were only able to use the plant in respect of the production of one house. This we did successfully throughout last winter.

The system is an extremely simple one, and has great possibilities. It appears, however, not to be suited to universal use, for the Chief Engineer of the South Suburban Gas Company, Mr. John Terrace, who made a special visit for the purpose of examining it last year, was unable to recommend its adoption at any of the three stations of that Company.

Certain conditions of design and adaptation have to be complied with, and the best advice I can give to those contemplating its installation is to place themselves into communication with M. Louis Cros, the Managing Director of the European Gas Company's works at Rouen, and see for themselves of what the plant is capable.

Even if, like Mr. Terrace, they return unimpressed with its usefulness to them, they will never regret the opportunity of visiting one of the most interesting of the large cities in Northern France.

CHARLES CARPENTER.

South Metropolitan Gas Company,
709, Old Kent Road, S.E. 15,
March 20, 1928.

Institution Education Scheme and Correspondence Classes.

SIR,—Permit me to point out that the correspondence published in your last issue, relative to the training of students in Science by correspondence for the examinations of the City and Guilds of London Institute in Gas Supply and Gas-Works Practice is not complete. Consequently, it gives a misguided view of the point at issue.

The question arises from the anomalous position of the Committee with regard to the training of students in the ancillary subjects in which they were placed by the regulations existing prior to June 14 last, under which it was possible for students to obtain by correspondence the whole of their training in the ancillary subjects specified for the examinations of the City and Guilds of London Institute, but not in the case of the examinations of the Institution of Gas Engineers. The reason for this was simply because it was impossible to arrange classes in Technical Schools to cover the specified syllabus in Science for these examinations, except in very few areas. In consequence of this position, which was brought to a head by the Junior Gas Associations with the opposite objective—namely, of obtaining the same concession for candidates for the examinations of the Institution—the regulations were modified to compel students to attend Technical Schools for training in Science for these examinations, although fully approved courses (that is, courses strictly in accordance with the syllabus drawn up) could not be arranged, owing to the lack of sufficient students.

Observing the significance of the changes in the regulations, I sent the following letter to the Advisory Committee:

DEAR MR. HOLE,—I should be very pleased to have your guidance on the following matter, so that I may not inadvertently wrongly advise would-be candidates, during the coming winter, for the examinations of the City and Guilds of London Institute in Gas-Works Practice and Gas Supply Practice.

I take it that in districts where courses have not been arranged under the scheme for these regulations, a student may proceed as under the old regulations to take his tuition with us, for the examinations in Gas-Works Practice or Gas Supply Practice, and Science; the only difference being that in this case he will be required to satisfy the Gas Education Committee, instead of the local authorities, as heretofore, that it has been impossible for him to obtain the requisite instruction by attendance at an approved course at a Technical School.

I wish also to take this opportunity of pointing out that we have a large number of students who have already completed the first year's work for these examinations, secure in the knowledge that they could satisfy the local Education Authorities. It is for this reason that I am anxious to know the precise significance to students of the change of authority in respect of these examinations. As these students will be commencing their second year's work the first week in August, I would much esteem the favour of an early reply.

(Signed) ARTHUR COE.

June 29, 1927.

This letter was duly considered by them, and the following letter appeared in the Press:

Education Scheme and Exemption.

SIR,—It has been pointed out in connection with the revised Education Scheme that there are many students in the country who, in the absence of public facilities for instruction, have arranged for, and are now part-way through, a course of private tuition. A strict application, therefore, of Regulation 3, p. 48, of the new "Green Book," would have the effect of penalizing all such, if classes are subsequently commenced in the district. It has therefore been decided that any candidate who can satisfy the Gas Education Committee that before the establishment of a course in an approved school he had entered upon another course of suitable study, may apply for exemption in this respect.

WALTER HOLE,
Organizing Secretary.

July 21, 1927.

This, I was informed, was the official reply to my letter of June 29. It will be clear from this letter, so far as the candidates in question are concerned, that the only reasonable way in which they could convince the Committee that they had commenced upon a course of private tuition for the examinations in Science of the City and Guilds of London Institute prior to June, 1927, would be for the person responsible for their training to certify that they had done so. My correspondence relating to these applications was published in your last week's issue, with the exception of the formal application below.

SIR,—I beg to apply for permission to sit for the forthcoming examination of the City and Guilds of London Institute in Gas Supply Practice/Gas-Works Practice.

I have been a student of the Gas College from the session commencing in 1926, and hope to conclude the full two years' instruction in time to sit at the above examination.

I trust that this application may be considered under the exemption announced by you in the "GAS JOURNAL" for July 27 last, p. 223. There were no local approved classes which I could attend for instruction for these examinations when I commenced my studies.

I trust that this application will be favourably considered, and beg to remain

Yours respectfully,
(Signed on behalf of the student).

I hereby certify that is now taking up the second full winter's course for the above-mentioned examination of the City and Guilds of London Institute. The two years' work completed in April covers fully the official syllabus in both the main and all ancillary subjects.

(Signed) PRINCIPAL OF THE GAS COLLEGE, HALIFAX.

Unfortunately, this formal application was construed to fall under the regulations of the Institution relating to Technical Schools, although it makes perfectly clear the fact that it is concerned solely with the peculiar circumstances indicated. This is shown in the reply dated Feb. 29, 1928, the first three clauses in which are obviously uncalled for, as no private schools in the country are recognized by the authorities for training in the ancillary subjects.

The following letter was therefore dispatched to the Advisory Committee, and submitted to them on the 13th inst. This should obviously have been published with the rest in your last week's issue, to give a perfectly clear account of the matter raised. Incidentally, this letter clears-up the suggestion which occurs in the letter to the District Secretaries dated March 2, 1928, to the effect that probably many of these candidates have been misguided.

DEAR SIR,—I wish to thank you for your letter of the 29th ult., and to say that I much appreciate the clear way in which the various points have been set out for my information. Unfortunately, it would appear from these that the applications of these students have been misunderstood. Permit me, therefore, to make them clear.

(1) Without exception every student who had completed the same work last year as these students will have done this year was accepted by Local Education Authorities for the examinations of the City and Guilds of London Institute. The following is a summarized list of students who sat last year, and the results:

Gas-Works Practice,	1st	Class.	.	5	out of	8	certificates	awarded.
"	"	2nd	"	.	.	4	"	"	7	"	"
Gas Supply	"	1st	"	.	.	2	"	"	2	"	"
"	"	2nd	"	.	.	4	"	"	8	"	"

These include the second prize in Gas-Works Practice, and the first, also the second, in Gas Supply Practice, open to the whole country for competition.

(2) The whole of the students applying this year commenced their studies in the winter session 1926-27, and had completed one winter's work prior to the new regulations with regard to applications to sit for the above-mentioned examinations.

(3) Realizing the "exact significance" of the changed regulations, I wrote to you raising the question of the position of these students on the 29th of June last. The official reply to this was your letter to the Press dated July 21, 1927.

(4) I should like to emphasize the fact that at the beginning of this winter session no District Committees had been formed, to whom students could be referred, as these were not announced until December. For this reason, in issuing instructions to would-be candidates, so that their position would be clear, I issued a plain statement, of which a copy is enclosed (a copy was sent), from which you will ob-

serve that a letter from some responsible person was requested certifying the non-existence of classes. No doubt, the engineers of the various works concerned will support the applications of these students, especially as there was no other course of action open to them before the District Committees commenced to function properly. From these facts, it will be seen that the vouchers I have supplied these students with are not intended to be taken as equivalent to those from the Principals of approved Technical Schools, but simply as a statement of fact concerning the position of these students relative to the "exemption" stated in the letter published in the "GAS JOURNAL" dated July 21, 1927. Also, the whole question here is one of "good faith," as set out in my letter of June 29 last.

(5) Referring to your note 6. I am perfectly clear upon this under the new regulations; but under the regulations of last year no objection was raised by Local Education Authorities to students who had obtained their instruction in this way, when they had not provided classes covering the syllabus laid down for these examinations. Your point 7 turns entirely upon this, as without exception the students who resided in areas where Technical Schools were available made the requisite inquiries with regard to specific classes for these examinations, and in the absence of approved courses quite naturally had no alternative but to pursue the course they have. I am clear upon the point that in future special efforts will be made to provide instruction in Science at schools where it is not possible to run complete courses.

(6) With regard to note 8, I shall be pleased to refer all students in future to the District Committees, as required. My only point in this correspondence is to avoid any misunderstanding whatever with regard to the position of these students relative to this peculiar transition period (*i.e.*, from one set of regulations to another), and in doing so to emphasize the fact that, under the regulations of last year, it is clear that no objection whatever would have been offered to their acceptance by Local Education Authorities.

I trust that this misunderstanding will not penalize these students in any way; and I await the decisions of the District Committees with interest.

(Signed) ARTHUR COE.

March 2, 1928.

The reply to this has been the publication of the correspondence, with the exception of the letters given above.

SUMMARIZING.

(1) The fundamental point involved in this correspondence strikes at the root of the Scheme, as the following facts show. In the case of the examinations of the Institution of Gas Engineers, there are no examinations in the ancillary subjects, a voucher from the Principal of the approved school certifying the standard of knowledge replacing this; but in the case of the examinations of the City and Guilds of London Institute, examinations are actually conducted, and a syllabus of the work to be done is clearly defined. In this case, therefore, the examination is the test. The new regulations, however, require attendance at Technical Schools for this training, even to the point of completely ruling-out shift workers and those who reside in areas where Technical Schools are not available. This position is logically untenable. Further, no other profession attempts to impose such conditions on would-be candidates.

(2) As there were no means whatever at the beginning of the present winter of arranging special courses of instruction in Science for isolated students (the District Committees were announced in December), it is very difficult to see why the students above referred to who obviously fall under the letter of July 21, 1927, should not be granted without question permission to sit for the examinations of the City and Guilds of London Institute, when if they fail in the Science section it will be soon enough to prescribe further instruction for them. It will be observed throughout the whole of the official replies in this correspondence that the non-existence of proper facilities in Science for the examinations of the City and Guilds of London Institute is tacitly admitted.

(3) Point 6, letter of Feb. 29, 1928. Unfortunately, as the London University has accepted upwards from 50,000 successful students for their external examinations who have been trained by correspondence schools, the Committee has no alternative, by accepting Matriculation as part qualification for students for the Diploma, than to accept occasionally correspondence school-trained candidates. If it does not do so, it will have, in many cases, to refuse to accept graduates of this University.

I regret the necessity to reply to this correspondence in the Press, as it once again raises the fact that the scheme is fundamentally unsound, and that there will be nothing but repeated misunderstandings, difficulties, and hardships for isolated students, together with endless meetings of Committees and useless expenditure of time and money, until the lead of every other profession is followed in this respect, and examinations are arranged by the Institution of Gas Engineers themselves in the ancillary subjects, as suggested by the Junior Gas Associations last year; for this will at once place at the disposal of the industry every teacher and school in the country of every denomination and class. Presumably, the new Charter of the Institution will make it possible to achieve this.

ARTHUR COE, *Principal.*

The Gas College,
3, *Thrum Hall Lane,*
Halifax,
March 22, 1928.

REGISTER OF PATENTS.

Purification.—No. 278,700.

SOCIÉTÉ DU GAZ DE PARIS, of Paris.

No. 25,725; Sept. 29, 1927.

Convention date: Oct. 11, 1926.

This invention relates to the purification of illuminating gas, and more particularly to the elimination of sulphuretted hydrogen and hydrocyanic acid. It has already been proposed to effect this elimination by acting on the gas with a mixture of a solution of ferrous salt and milk of lime in two successive stages; a first stage in a liquid form for the complete removal of the compounds in solution containing cyanogen, and a second stage in a dry state after elimination of the solution for the complete removal of the sulphuretted hydrogen.

By the present invention, in the first stage a mixture of a solution of ferrous salt and milk of lime is used, the action taking place as aforesaid in a liquid form. In the second stage the action also takes place in a liquid form, the liquid obtained by suspension of the powdered solid residue from the first stage being used in the second stage and subjected alternately to the passage of the gas and to regeneration.

The process is carried out in the following way. The mixture obtained by the action of the solution of ferrous sulphate on the milk of lime is sufficiently liquid to flow without excessive loss into the purifier, in which the raw gas is made to act on this mixture. On issuing from the purifier, the liquid part is separated out by a filter press; and the solid residue, after exposure to the action of the air, is powdered and placed in suspension in water, before being traversed by the gas previously freed from cyanogen in the first stage.

In the first liquid stage the mixture of the solution of ferrous salt and milk of lime having been made in the absence of oxygen, the hydrocyanic acid contained in the raw gas is fixed in the condition of calcium cyanate and completely dissolved; and a part of the sulphuretted hydrogen of the gas combines with the iron hydrate in excess forming iron sulphide, which remains in the solid residue.

The passage through the filter press thus allows of separating the whole of the cyanogen compounds contained in the liquid. The solid residue, dried in the air, is oxidized, and consists of a mass of ferric hydrate mixed with sulphur, calcium sulphate, and calcium carbonate. This mass is then powdered and placed in suspension in water in suitable vessels, such as purifiers, scrubbers, and the like. The gas freed from the hydrocyanic acid in the first stage is then brought into contact with the suspension, when the sulphuretted hydrogen is removed in the form of iron sulphide in suspension in the water. The mass of liquid is then subjected to the action of the air to convert the iron sulphide into ferric oxide with setting free of the sulphur; the gas may then be again passed, and these operations be recommenced until the content of free sulphur in the solid part is such that the mass of liquid becomes too inactive to remove efficiently the sulphuretted hydrogen. At this point the solid residue may be separated and subjected to suitable treatment for the recovery of the sulphur, unless the greater part of the sulphur has been extracted by known processes at each successive regeneration, in which case the mass of ferric oxide can continue to serve.

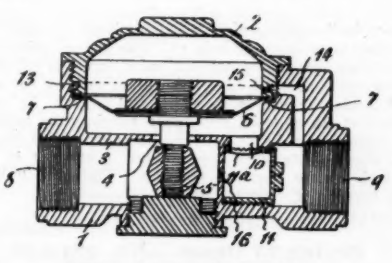
The process may be carried out by making use of the customary plant, so as to obtain a continuous purification of the gas.

Automatic Gas Regulator.—No. 285,701.

WILLIAMS, G. A., of Stoke Newington, N. 16.

No. 14,184; May 26, 1927.

This invention relates to automatic gas regulators of the kind in which a diaphragm actuated valve is employed, said diaphragm upon one side being subject to the inlet pressure and upon the other side to the outlet pressure, an adjustable or interchangeable restricting device being provided in the main conduit between the inlet and outlet connections.



Williams' Automatic Regulator.

The general construction of the regulator will be understood from the vertical section which we reproduce. The feature of the invention is that disposed within the outlet passage 9 is a screwed sleeve 11 having at its outer end means for effecting its ready rotation. This sleeve is provided with a circumferential opening 11*a* which when the sleeve is rotated may be brought more or less into coincidence with the passage 10, thereby permitting the ready regulation of the quantity of gas passing through the regulator. The sleeve 11 is of such length that its outer end is disposed at some distance from the

outer end of the passage 9, so that it does not prevent the ready connection of the device to the union or nipple of the heater.

13 indicates a passage formed by reducing the diameter of the inner end of the screwed flange of the closure 2; said passage communicating with a passage 14, one end of which is above the level of the diaphragm 6, the other end of said passage communicating with the discharge passage 9. By this means any gas escaping to the upper side of the diaphragm will escape through the discharge passage 9; openings such as 15 being provided in the reduced portion of the flange to permit the escape of gas to the passage 13.

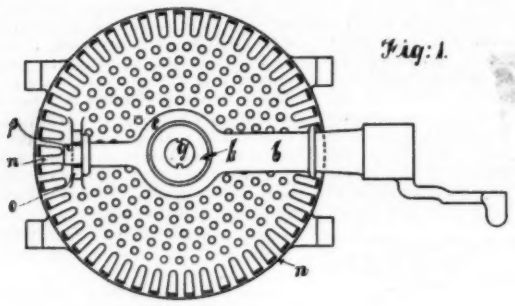
In order to prevent unauthorized removal of the cap, a screw may be provided countersunk into a convenient part of the case—for example, into the external vertically disposed projection in which is formed the passage 14. The head of the screw may be sealed with wax.

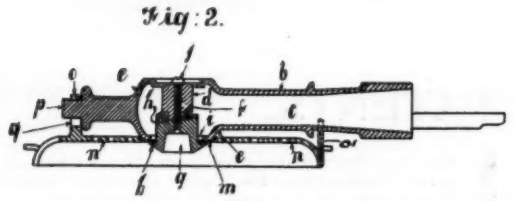
Boiling and Grilling Burners.—No. 284,923.

Oakley, P., Richardson, W. H., and Stoves, Ltd., all of Rainhill.

No. 16,426; June 21, 1927.

This invention relates to a gas burner, adopted to be used either for boiling or grilling, of the general form described in specification No. 179,488 [see Journal, Vol. 158, p. 634]. Certain improvements are now covered; and these will be understood by reference to fig. 1, a plan of the complete device, and fig. 2, a sectional elevation with the burner turned into the grilling position.





A Combination Boiling or Grilling Ring.—Stoves, Ltd.

The tube *b* has a passage *c* for the gas and air mixture and a boss *d* projecting from the flat portion of the bulbous portion *e*. The boss *d* is reduced in diameter at its free end to provide a spigot portion *f* on to which is fitted the flame spreader *g*, which is recessed at its inner end at *h* to correspond. The faces between *d* and *g* are machined so as to make the part *g* concentric with the hole *i* in the bulbous portion of the tube *b*. The flame spreader *g* is secured by a screw *j* passed through the boss *d* into it. The hole *i* is bored to a standard diameter. The flame spreader *g* is machined all over, its flange *k* being turned to a feather edge with its inner face at right angles to its axis. By this means a sharper and more regular or round gas flame is produced with no broken edge. The gas and air mixture flows smoothly, and rattle or noise is eliminated; and by fitting the flame spreader as described, when the gases flow along the mixing tube *b* they strike the centre boss, distribute within the body of the burner, and then travel to the annular outlet of the burner.

The hole *m* in the griller plate *n* is machined to a bevel to allow the bulbous portion to fit *e* in the hole *m*. The burner tube *b* is supported at one end in an upstanding slotted ear *o* through which its reduced end *p* passes, and, if required, at the other end by ear o^1. The slot in the ear holds the end *p* laterally and allows the tube *b* to be lifted slightly at its opposite end when turning the burner from the grilling position shown in fig. 2 to the boiling position shown in fig. 1. The ear *o* also co-acts with the bulbous portion *e* in keeping the burner tube *b* in the required position. The tube *b* has a handle to assist in turning it.

Drying of Gases.—No. 285,936.

Cooper, C., and Holmes, W. C., & Co., Ltd., both of Huddersfield.

No. 26,319; Oct. 21, 1926.

The object of this invention is to provide an improved process and apparatus for the drying of fuel gases by bringing the same into intimate contact with hygroscopic material in the liquid state with periodic or continuous regeneration or reconcentration of the water-absorbing material. The invention is characterized in this, that the circulation of the hygroscopic material for securing dissipation of the heat developed as the result of removal of moisture from the gases is independent of its circulation for regeneration purposes. Further, the withdrawal from contact with the fuel gas of the hygroscopic material to be treated for regeneration is preferably effected independently of the withdrawal for the dissipation of heat.

Normally the operation will be carried out in such manner as to avoid reducing the temperature of the gases materially below the temperature of the atmosphere or dissipating more heat than that set free by the process of moisture removal. The cooling operation may be carried out in such a manner as merely to prevent the final temperature of the gases rising above their temperature when initially subjected to treatment for the removal of water.

Apparatus of widely varying character may be employed; but the familiar Holmes rotary scrubber is shown in the drawing which accompanies the complete specification.

Broadly, apparatus in accordance with the invention comprises means for bringing gas and hygroscopic material in the liquid state into intimate contact, a cooling device, a circulatory system, means securing regeneration or reconcentration of the material, and a circulatory system independent of the first-mentioned circulatory system adapted to cause the material to travel through the means for bringing it into intimate contact with the gas and through the means adaped to secure its regeneration or reconcentration. Normally, for the purposes of the invention the cooling action of water will be sufficient.

When employing a "brush washer," a section of the washing space of the washer—for example, the last one-third—may be associated with cooling means, being provided with an outlet for the liquid or water-absorbing body associated with a pump adapted to withdraw continuously the water-absorbing body from this section of the apparatus, deliver it to cooling means, and return it to the said section of the apparatus.

APPLICATIONS FOR PATENTS.

Nos. 5997—6756.

Barrett Company.—"Distillation of tar." No. 6647.
Bornefeld, G.—"Gas regulators." No. 6326.
Brooke, R. M.—"Charging gas retorts with coal." No. 6404.
Carmuirs Iron Company, Ltd.—"Gas fires." No. 6018.
Gadd, A.—"Gasholders." No. 6676.
Goodman, R. M.—"Conveying coke." No. 6225.
Harvey, L. C.—"Retorts for destructive distillation of solid materials." No. 6222.
Helps, A. M.—"Gas cookers." No. 6026.
Jenkins & Co., Ltd., W. J.—See Goodman, R. M. No. 6225.
Jenkins & Co., Ltd., W. J.—See Brooke, R. M. No. 6464.
Rostin, H.—"Treatment of products of carbonization." No. 6497.
Scott, F. S.—"Gas ovens." No. 6743.
Small, A. G. M.—"Gas fired water heaters." No. 6154.
Small, A. G. M.—"Thermostats for water heaters." No. 6165.
South Metropolitan Gas Company and Stanier, H.—"Treatment of oils, &c., derived from coal." No. 6731.
Wilkie, J.—See Carmuirs Iron Company, Ltd. No. 6018.

Nos. 6757—7516.

Aldridge & Ranken, Ltd.—"Coke shoots for horizontal gas retorts." No. 7279.
Barrett Company.—"Dehydration of tar." No. 6812.
Falkner, A. J.—"Gas valves." No. 7375.
Green, R. W.—See Aldridge & Ranken, Ltd. No. 7279.
Holzwarth Gas Turbine Company of America.—"Blades for gas turbines." No. 7499.
Horstmann, B. G. and J. H. G.—"Devices for operating gas valves from a distance." No. 6920.
Humphreys & Glasgow, Ltd.—"Bins for hot coke." No. 6830.
Jagschitz, K.—"Gasometers." No. 7507.
Kuehn, P. M.—See Jagschitz, K. No. 7507.
Laing, B.—"Distillation of carbonaceous materials." No. 6802, 6803, 6804.
Nielsen, H.—See Laing, B. Nos. 6802, 6803, 6804.
Smith, A. H.—"Device for preventing downdraught in geysers." No. 6939.
West's Gas Improvement Company, Ltd.—"Wagon tipplers." No. 7504.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

Progress of Bills.

Barnet District Gas and Water Bill: Read the second time, and committed.
Otley Gas Order: Referred to the Special Orders Committee.
Annfield Plain and District, Ilkley, Newcastle-upon-Tyne and Gateshead, Oldbury, and Southend-on-Sea and District Gas Orders: Agreed to.

HOUSE OF COMMONS.

Progress of Bills.

Coventry Corporation and South Metropolitan Gas Bills: As amended, considered; to be read the third time.
Otley Gas Order: Copy presented.
Annfield Plain and Oldbury Gas Orders: Approved.

MISCELLANEOUS NEWS.

GAS COMPANIES' RESULTS FOR 1927.

ABINGDON.

The output of gas increased in 1927, and dividends were declared of 17s. 6d. on the original and "A" shares and of 13s. 9d. on the "B" shares. It has been decided to reduce the price of gas at the next meter reading by 3d. per 1000 c.ft.

BRIXHAM.

At the Annual Meeting of the Brixham Gas Company, presided over by Mr. A. SCOTT, the accounts presented showed a profit on gas of £3513, and on electricity of £1308. After payment of interest on debentures and loans and the interim dividend to June 30, and carrying £334 to the renewal fund, there remained a balance of £5276, out of which the Directors had paid the preference dividend to Dec. 31, 1927, and recommended the payment of the standard dividend for the final half-year at the rate of 12 p.ct. on the original ordinary shares and £8 8s. p.ct. on the additional ordinary shares.

BURGESS HILL.

At the Annual Meeting of the Burgess Hill and St. John's Common Gas Company, Lieut.-Col. S. T. MAYNARD, J.P. (Chairman), recommended dividends of 7½ p.ct. on the original shares and 5½ p.ct. on the new ordinary shares, free of income-tax in each case. These were declared.

DARTMOUTH.

At the Annual Meeting of the Dartmouth Gas, Coke, and Coal Company, Ltd., dividends were declared of 5 p.ct. on the second preference shares and 12 p.ct. on the ordinary shares, both less income-tax. The balance carried forward to the next account was £610.

GOSPORT.

Presiding at the Annual Meeting of the Gosport District Gas Company, Mr. W. E. CHURCHER (the Chairman) referred to the fact that four new records had been made during the past year. For the first time the profit for the year was expressed by five figures—namely, £12,208; secondly, the number of consumers had now passed the 10,000 mark; thirdly, the quantity of gas made, 348 million c.ft., was higher than in any previous year; and lastly, the quantity of gas sent out from the works on Christmas Day had exceeded the previous record. The sales for 1927 were higher by nearly 11 million c.ft., and in the last nine years they had more than doubled. Since the beginning of the present year, the quantity of gas sent out from the works had already exceeded that for the corresponding period of 1927; and in anticipation of this they had extended the carbonizing plant and installed a telpher coke handling plant. A new gasholder having a capacity of one million c.ft. was in course of erection.

In accordance with the announcement made a year ago, the Directors had been able to realize their intention of reverting to the pre-coal stoppage price for gas; and at the end of the June quarter last year a general reduction was made to all districts. As the result of the increased sale of gas in the Fareham district, a total reduction of nearly 9d. per 1000 c.ft. had been made in that district within the last fifteen months, and further reductions would be made as the use of gas increased. The acquisition of the Fareham Company has thus been of great benefit to all consumers throughout the Company's area of supply, as the larger quantity of gas required had been produced at less cost than if the amalgamated Companies had remained separate entities. As from the end of the present (March) quarter, it had been decided to reduce the price of gas in the Lee-on-the-Solent district, including Hillhead and Stubbington, by 3d. per therm. The number of appliances on the district had increased by 1859, which included 870 cookers, 614 fires, 153 geysers, 196 boilers, and 26 radiators.

The report and accounts were adopted, and dividends were declared making a total distribution for the year of 5 p.ct. on the preference stock and £6 12s. 9d. p.ct. on the consolidated ordinary stock.

HEXHAM.

When moving the adoption of the report and accounts at the Annual General Meeting of the Hexham Gas Company, Mr. WILLIAM PATTINSON said it was gratifying to be able to report a further increase in the consumption of gas. The new showrooms and offices were opened in May last; and the sales of cookers, fires, &c., had greatly increased as the result of this venture. During the dispute in the coal trade the price of coal reached very high figures; but the Company was one of the few who were able to carry on without increasing the price of gas. A dividend of 6 p.ct. (less income-tax) on the ordinary stock was declared for the year, inclusive of the interim dividend paid in September. A balance of £934 is carried to the next account.

PONTYPOOL.

Mr. T. H. DEAKIN, J.P., presided at the Annual Meeting of the Pontypool Gas and Water Company, when dividends for the year were fixed as follows: On the £12 stock and "A" shares, 7½ p.ct.; and on the "B," "C," and "D" shares, 5½ p.ct., less tax. The Chairman said the year had been a fairly satisfactory one. The price of gas had been lowered to the pre-strike figure, which meant a concession of £1000 to the Company's customers.

ROTHWELL.

Mr. GEORGE ARMITAGE, presiding at the Half-Yearly Meeting of the Rothwell Gas Light Company, stated that they had every reason to feel satisfied with the results. A total of 36,222,000 c.ft. of gas had been made during the half-year, for which purpose 2750 tons of coal had been carbonized. The average make was 13,171 c.ft. per ton; while the sale of coke had averaged 12 cwt. per ton of coal carbonized. During the same period 94 new consumers had been added, which, with 104 added the previous half-year, made a total of 198 for the year. In spite of the keen competition from electric light, it was very satisfactory to note that the output of gas had largely increased. The maximum dividends of 10 p.ct. per annum on the original shares and 7 p.ct. per annum on the additional shares were declared.

SEAHAM.

Presiding at the Annual Meeting of the Seaham Gas and Lighting Company, Mr. MALCOLM DILLON said the expenditure last year was down by £2600. Local rates amounted to more than 6½d. per 1000 c.ft. of gas sold, as compared with 2d. in 1914. An increased amount of gas had been sold, and the income from residual products had increased. Reductions had been made in the price of gas amounting to 10d. per 1000 c.ft., and a further reduction would probably be made soon. Dividends were declared of 8 p.ct. on the "A" stock and "B" shares, 6 p.ct. on the "C" stock, and 4½ p.ct. on the preference stock.

SEATON.

The report of the Seaton Gas and Coke Company, Ltd., stated that the revenue of the Company during the past year showed a gratifying increase, while the profits were steadily maintained. The revenue account showed a profit for 1927 of £1218, and a dividend of 7 p.ct., less tax, was recommended. An important extension had been successfully carried out by linking-up the growing district of Beer with an independent main. In order to make provision for future extensions, a piece of ground adjoining the works had been purchased.

SEVENOAKS.

During the year the price of gas was reduced by 1d. per therm in January, 2d. in April, and ½d. in October; and the Directors have reduced it by a further ½d. per therm as from the end of the present quarter. The output of gas was greater than in 1926, and an order has been placed with Messrs. Gibbons Bros. for an extension of carbonizing plant. At the Annual Meeting, dividends of 10 p.ct. on the "A" shares and 7 p.ct. on the "B" shares, both less tax, were declared.

SHEPPY.

The sales of gas increased during the year by nearly 4 p.ct. During the past five years the sales have increased by nearly 25 p.ct. During the year the price of gas was twice reduced by 1d. per therm in each case. Final dividends were declared of 4 p.ct. per annum on the "A" preference shares, and 5 p.ct. per annum on the consolidated ordinary stock, both less income-tax.

SHOTLEY BRIDGE.

The most important feature of last year, said Lieut.-Col. W. H. RITSON, presiding at the Annual Meeting of the Shotley Bridge and District Gas Company, was a reduction in the price of gas. A dividend of 5 p.ct. was declared.

SOLIHULL.

At the sixty-first ordinary general meeting of the Solihull Gas Company, Birmingham, Mr. EDMUND ALLDAY (the Chairman) said a much larger number of new consumers had been added than in any previous year. The consumption of gas continued to expand, and the sale during the past year of cookers and appliances had been a record. The price of gas had been reduced by 2d. per therm, equivalent to 10d. per 1000 c.ft. Final dividends were declared making a total for the year of 10 p.ct. on the original ordinary shares.

STEYNING.

The sales of gas in 1927 showed an increase of 9 p.ct. A dividend of 9 p.ct., less income-tax, was declared.

TAVISTOCK.

At the Annual Meeting of the Tavistock Lighting, Coal, and Coke Company, Ltd., a final dividend at the rate of 5 p.ct. for the half-year was declared on the original capital and 3½ p.ct. on the additional capital.

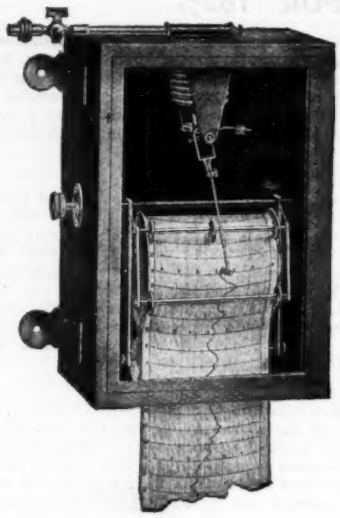
THIRSK.

The report of the Directors shows that on revenue account there is a profit of £1809 for the year; and the profit and loss account, after being charged with the interim dividend and interest on the debentures, preference shares, and bank charges to Dec. 31 last, has a credit balance of £1708. It is recommended that a dividend of 4 p.ct. on the £12,000 share capital, less income-tax, be paid, making, with the interim dividend, 7 p.ct. for the year; that £200 be written off meters and cookers; and that the balance of £1028 be carried to the next account.

LECTURES ON GAS COOKING AND HEATING.

To-day Mr. Brinsley, of the Research Laboratories of Radiation Ltd., will give a lecture on "Heating by Gas, and Ventilating," at Bath. The following is a list of the lectures to be given by Mr. Brinsley during April:

April 2.—Lecture on "Cookers," Solihull Gas Company's Offices, Mill Lane, 3.30.
April 3.—Lecture on "Cookers," at Darlington, 5 o'clock.
April 4.—Lecture on "Hot Water Apparatus," Gas Showrooms, Middlesbrough, 4 o'clock.
April 12.—Lecture at the Andover Gas Company's Offices, 2.30.
April 16.—Lecture on "Cookers," Cookery Lecture Hall, Gas Offices, Eastbourne, 7 o'clock. Newhaven, Seaford, and Lewes salesmen invited.



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AUSTRALIAN GAS LIGHT COMPANY.

The Adjourned Annual General Meeting of the Company was held in Sydney on Feb. 9—Mr. GEORGE J. COHEN (Chairman) presiding.

The GENERAL MANAGER AND SECRETARY (Mr. Andrew Wilson, M.Inst.C.E.) submitted the Auditors' certificates of profits and the Directors' statement recommending the payment of a dividend for the half-year of 4 p.ct. on the old "A" shares and in proportion on the new "A" shares.

Directors' Statement.

	£	s.	d.
The net profits for the past half-year, in accordance with the Auditors' certificate of profits, including the balance brought forward, amount to . . .	218,327	3	1
The Directors recommend the payment of a dividend for the six months of 4 p.ct. on the old "A" and "B" shares, and in proportion on the new "A" shares, which will absorb	147,316	2	6
Leaving a balance to be carried forward of . .	£71,011	0	7

On the motion of the CHAIRMAN, seconded by the DEPUTY-CHAIRMAN (Mr. A. Consett Stephen), the statement was unanimously adopted.

IRISH TOWN TURNS DOWN ELECTRIC SCHEME.

After full discussion at a special meeting, the Ballymena Town Council have turned-down the proposal of a London Company for the electric lighting of the town in lieu of the present gas system. The Chairman (Mr. W. Shaw) explained that briefly the proposal was that the firm should apply for an Order permitting them to erect a generating station of sufficient capacity to supply the entire urban area at a maximum price of 1s. per unit. If they obtained the Order, they would bear the cost of promoting and carrying out the undertaking. The initial expenses, it was thought, would be about £25,000; but additions which would become necessary would probably represent another £25,000. By selling current at 9d. per unit, the income would be sufficient to pay the interest on the £50,000 and the expenses of carrying on the undertaking.

The firm's representative stated that if a generating station was erected the gas undertaking would be deprived of the sale of 26 million c.ft. for lighting. This would mean an anuual loss of approximately £8000. The firm might consider taking over the gas-works with the debt thereon (£29,000), so as to work them in conjunction with the electric system. The ratepayers could at the end of (say) thirty years purchase the entire undertaking (electricity and gas) at a price to be fixed by arbitration. He suggested that, if the time had come to put up a generating station, they should do it themselves at the gas-works, and run the two systems in conjunction. The present staff at the gas-works, with the addition of an electrical engineer, would, he believed, be able to run both systems. Thus the profit to be made, instead of being paid to strangers, could be used in reduction of the rates.

Mr. Thomas Kerr, J.P., said it would be a great mistake to hand over their lighting powers to any outside authority. The gas-works had cost between £50,000 and £60,000. When they had a surplus they could take into consideration an electric lighting scheme. Mr. Murphy said they had recently installed new gas retorts at a cost of £20,000.

JOINT INDUSTRIAL CONFERENCE.

The first Joint Committee for the consideration of the agenda for the Industrial Conference between the General Council of the Trades Union Congress and the Representative Group of Employers was held on Wednesday, March 21, in the apartments of the Royal Society, Burlington House, Piccadilly.

Sir Alfred Mond was voted to the chair, on the proposition of Mr. Ben Turner, Chairman of the General Council of the Trades Union Congress. Sir Alfred Mond proposed that the chair should be occupied at the next Joint Committee meeting by Mr. Ben Turner, and subsequently by alternate Chairmen; and this was agreed to.

There were present: Sir Alfred Mond, Mr. Ben Turner, Sir David Milne-Watson, Lord Londonderry, Lord Ashfield, Col. Vernon Willey, Mr. George Hicks, Mr. W. M. Citrine, Mr. Arthur Pugh, Mr. Ernest Bevin, Mr. Tom Richards, Mr. Will Thorne, and Mr. Conway Davies and Mr. W. Milne Bailey, Secretaries. Apologies were received from Lord Weir and Sir Hugo Hirst for their absence, as they were abroad.

The question of the agenda was discussed fully; and it was decided that the agenda agreed by the Joint Committee should be referred respectively to the General Council of the Trades Union Congress and the Representative Group of Employers. It was arranged that for the consideration of the various items of the agenda further Joint Committee meetings should be held weekly.

In view of the large field of industrial problems covered by the agenda, and the importance of those problems, it was agreed that some lapse of time must occur before any complete and detailed information could be communicated to the Press. Arrangements will be made for further full joint conferences as required.

Price Reduced at Bristol.—The Directors of the Bristol Gas Company have reduced the price of gas consumed during the quarter ending June 30 to 7½d. per therm. They have also revised the scale of discounts. For a consumption of 120 therms and up to 240 therms per quarter, the discount will be 2½ p.ct.; 240 to 480 therms, 5 p.ct.; 480 to 1200 therms, 7½ p.ct.; and over 1200 therms, 10 p.ct.

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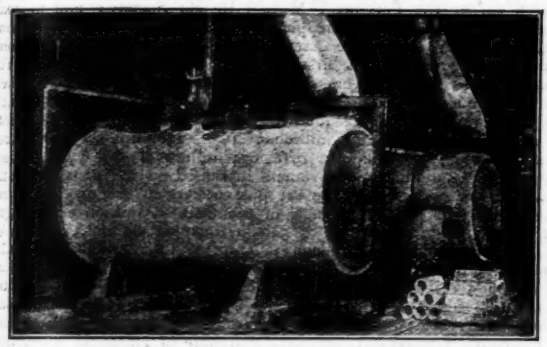

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COAL TRADE REPORTS.

From Our Own Correspondents.

NORTH-EAST COAST.

The market is looking slightly healthier; a better prompt demand having found it rather shorter of supplies. Output has been lower in the past week or two, owing to disputes of various kinds following the reduced wages rates. It is difficult to say what is the reason for the increased inquiry. It may be due in part to the approach of the Easter Holidays, though it is to be hoped that a more permanent cause may be the firm attitude adopted by collieries as to prices.

Wear Special gas makes are quoting 16s. f.o.b., and best qualities 15s. to 15s. 3d. Seconds are nominally 13s. 3d. to 13s. 9d. Durham coking is very quiet, and the demand very slow, but quotations are maintained at 13s. 3d. to 13s. 9d.; the output being below normal. Bunkers are in better demand, especially best brands, which are firmer at 14s. 6d. f.o.b. Northumberland steams are still holding to the minimum agreed prices, from 13s. 6d. for D.C.B. downwards. The coke market is very quiet, and little business is passing. Gas coke is nominally 20s. 0d. f.o.b. for shipment.

YORKSHIRE AND LANCASHIRE.

There is little change to report in regard to the industrial coal trade in Yorkshire and Lancashire. Forward business is rather spasmodic, and there have been reductions in some instances for prompt deliveries. Lack of details as to the working of the "Five Counties" scheme has created a feeling of uncertainty. House coal is in fair request, with prices steady.

The following are the Humber bunker and export prices, f.o.b. usual shipping ports:

South Yorkshire—Hards, Association, 15s. to 15s. 3d.; screened gas coal, 15s. 6d. to 16s.; washed trebles, 16s. to 16s. 3d.; washed doubles, 14s. 6d. to 14s. 9d.; washed singles, 14s. 3d. to 14s. 9d.; washed smalls, 11s. 6d. to 11s. 9d.; smithy peas, 16s. 6d. to 18s. 3d. per ton.

West Yorkshire—Hartleys (f.o.b. Goole), 14s. to 15s.; screened gas coal, 14s. 6d. to 15s. 6d.; washed trebles, 15s. to 16s.; washed doubles, 14s. 6d. to 14s. 9d.; washed singles, 14s. 3d. to 14s. 9d.; washed smalls, 11s. to 11s. 6d.; unwashed trebles, 14s. 9d. to 15s. 3d.; unwashed doubles, 11s. to 11s. 3d.; rough slack, 9s. 6d. to 10s.; coking smalls, 9s. to 9s. 6d. per ton.

Derbyshire and Nottinghamshire—Top hards, 15s. to 16s.; washed trebles, 15s. 6d. to 16s.; washed doubles, 15s. to 15s. 6d.; washed singles, 14s. 9d. to 15s. 3d.; washed smalls, 11s. to 11s. 6d.; rough slack, 9s. 9d. to 10s. per ton.

Yorkshire, Derbyshire, and Nottinghamshire—Screened steam coal, 14s. to 14s. 6d.; gas coke, 21s. to 24s.; furnace coke, 16s. 9d. to 17s. 6d. per ton.

Industrial fuel is in poor demand in Lancashire owing to short time in the cotton mills. Prices are: Lancashire best house coal, 31s. to 32s.; seconds, 27s. to 28s.; common, 19s. to 21s.; kitchen, 22s. to 24s.; Yorkshire selected house, 31s. to 33s.; best house, 26s. to 28s.; cobbles, 17s. to 18s.; washed doubles, 13s. to 14s.; washed singles, 12s. to 13s. in wagons at the pit.

MIDLANDS.

Nothing has occurred to relieve the flatness of the market except that with April at hand a very close look-out has been kept for portents in the coalfields to which the "Five Counties" scheme of control has extended. With systematic restriction of output imminent, individual collieries have adopted a bolder policy with regard to smalls. In free competition the best prices obtainable have been a good deal below those nominally ruling. Recently list prices have been reinstated, the danger of accumulating stocks being less intimidating.

How far the scheme is seaworthy, only the event will show. If is stated that a considerable proportion of collieries are holding aloof in coalfields which are supposed to be within the ambit of the experiment. However this may be, it is certain that some of those that have joined have done so unwillingly, because they thought they were not strong enough to take an independent line.

The state of the market in Derbyshire is illustrated by a tender for slack which the Poor Law Authorities of Birmingham have just accepted for a period of twelve months from April 1. The price was 4s. 6d. for 1¼ in., *plus* 3s. 6d. rail transport. A tender from a colliery near to the delivery point came out at 6d. more; but in this case 2¼ in. slack was specified.

Smokeless Fuel on Sale in Glasgow.—The Glasgow Corporation Gas Department have now taken over from the contractors the Maclaurin smokeless fuel plant which was installed at the Dalmarnock Gas-Works, and the final instalment of the contract has been paid. The Committee have given instructions for the sale to be begun of smokeless fuel in bags of 1 cwt., ½ cwt., and ¼ cwt. at 2s. 2d. per cwt. delivered.

Gibbons (Dudley), Ltd.—In their thirty-third annual report, the Directors state that the Company is still feeling the after effects of the coal strike; but the results obtained by the subsidiary companies have again been satisfactory. The net profit for the year, after providing for depreciation, is £14,628, which, added to the amount brought forward, makes a total of £24,729. Of this, the full preference dividend and the interim dividends of 7 p.ct. per annum on the ordinary shares already paid (free of income-tax) absorbed £11,462. The Directors recommend that a dividend of 3 p.ct. per annum (free of income-tax) be paid upon the ordinary capital, which, with the interim dividends already paid, will make a total of 10 p.ct. for the year. During the year Messrs. E. Masters and J. R. Masters resigned their seats on the Board.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *March 26.*

There is little change to report in the market for tar products.

Pitch continues quiet, and the price remains at about 65s. per ton f.o.b.

Creosote is steady at about 8¾d. per gallon f.o.b.

Tar spirits are unchanged; pure benzole being 1s. 5d. to 1s. 6d. per gallon, pure toluole about 1s. 10d. per gallon, and 95/160 solvent naphtha 1s. 3d. per gallon.

Pyridine is about 6s. per gallon.

Tar Products in the Provinces.

March 26.

There is practically no change in the market for tar products.

Pitch is quiet and unchanged in price. There is still a fair amount of demand for both this and next season: but the ideas of manufacturers are at present above those of consumers.

Creosote is steady, with a good demand for the home trade.

There is no alteration in the market price.

Crude carbolic continues in good demand for delivery over any period to the end of the present year. Cresylic acid of good quality is still eagerly competed for. A fair amount of business continues to pass in crystals carbolic.

The demand for pure naphthalene still continues.

The average prices of gas-works products during the week were: Gas-works tar, 46s. 6d. to 51s. 6d. Pitch—East Coast, 60s. to 62s. 6d. f.o.b. West Coast—Manchester, 57s. 6d. to 60s.; Liverpool, 60s. to 62s. 6d.; Clyde, 62s. 6d. to 65s. Benzole, 90 p.ct., North, 11½d. to 1s. 0½d.; crude, 65 p.ct. at 120° C., 8¾d. to 9¼d., naked at makers' works; 50/90 p.ct., naked, North, 1s. 2d. to 1s. 3d. Toluole, naked, North, 1s. 3d. to 1s. 4d.. nominal. Coal-tar crude naphtha, in bulk, North, 7¼d. to 8d. Solvent naphtha, naked, North, 8¾d. to 9¼d. Heavy naphtha, North, 8¾d. to 9¼d. Creosote, in bulk, North, liquid, 7¼d. to 7¾d.; salty, 7¼d. to 7¼d.; Scotland, 7¼d. to 7¾d. Heavy oils, in bulk, North, 8¾d. to 9¼d. Carbolic acid, 60 p.ct., 2s. 3d. to 2s. 4d. prompt. Naphthalene, £13 to £15; salts, £5 to £5 10s., bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

TRADE NOTES.

"W-D" Continuous Verticals for Crieff.

The Woodall-Duckham Vertical Retort and Oven Construction Company (1920), Ltd., have received an order from the Crieff Gas Light Company for an installation of "W-D" continuous vertical retorts capable of carbonizing 24 tons of coal per day. The contract includes a steam-engine driven lift for dealing with coal and coke, steel-framed brick-panelled retort house, and the necessary concrete foundations.

"Judex" Analytical Reagents.

The new catalogue of the General Chemical and Pharmaceutical Company, Ltd., Willesden, N.W. 10, contains a full list of analytical reagents guaranteed to conform to "A.R." Standards. Each "Judex" analytical reagent is tested under the personal supervision of highly qualified research chemists.

"W-D" Retorts for Hereford.

The Woodall-Duckham Vertical Retort and Oven Construction Company (1920), Ltd., have received an order from the Hereford Corporation Gas Department for an installation of twelve 62-in. "W-D" continuous vertical retorts, capable of carbonizing 68 tons of coal per 24 hours. The contract includes the erection of a steel-framed brick-panelled retort house and the necessary foundations. The installation is to be complete with coal handling plant, including plant for storing and reclaiming coal from the store, coke screening and storage plant, electrically driven lift, and waste-heat boiler plant.

CONTRACTS OPEN.

Ammoniacal Liquor Stills.

The Gas Committee of the Manchester Corporation invite tenders for the construction and erection of two ammoniacal (gas liquor) stills. [See advert. on p. 820.]

Coal.

The Audley Urban District Council invite tenders for the supply of best screened gas coal. [See advert. on 820.]

Gasholders.

The Manchester Corporation Gas Committee invite tenders for the dismantling, removal, and purchase of material contained in four gasholders. [See advert. on p. 820.]

Relief Holder and Tank.

The Burnley Gas Committee invite tenders for a water gas relief holder and tank. [See advert. on p. 820.]

Washing Plant.

The Directors of the Bilston Gas Light and Coke Company invite tenders for washing plant. [See advert. on p. 820.]

Issue of Stock at Grays.—Tenders for the 2000 £10 "B" ordinary shares and £10,000 5 p.ct. perpetual debenture stock, which Messrs. A. & W. Richards offered on behalf of the Directors of the Grays and Tilbury Company, were opened on March 22. Both issues were over-subscribed; the shares at prices ranging from £11 12s. 6d. per share down to the minimum of par, and the debenture stock at prices ranging from par down to the minimum of £97 per £100.

British Commercial Travellers' Club.

The first anniversary dinner was held on March 19, exactly twelve months after the official opening last year. Lord Riddell, who has accepted the presidency for the ensuing year in succession to Sir Ernest Benn, Bart., K.B.E., was the Chairman of the gathering, and was supported by Sir Herbert Morgan, K.B.E., Sir Stanley Machin, J.P., Mr. R. Storry-Deans, M.P., Mr. Percy Best, Mr. A. E. Hyland (Director of the Australian Trade Publicity), and others. After the Loyal Toast, Sir Herbert Morgan proposed the toast of the President, and Lord Riddell's response was, as usual, amusing as well as informative. Mr. T. W. Hancox, Chairman of the Club, proposed the toast of "Our Guests," to which Mr. R. Storry-Deans, M.P., responded. The toast of the Club was proposed by Mr. Percy Best, and responded to by Mr. John Kent, J.P., Chairman of the Finance Committee, in the regrettable absence of Mr. C. J. Kebbell, Hon. Secretary. "Our Dominion Members" was the toast proposed by Sir Stanley Machin, J.P., to which Mr. A. E. Hyland responded. As all the speakers had at one time or another been "on the road," the speeches were racily reminiscent, and as eminently practical as could be wished.

Luton Gas Company's Works.

The works of the Luton Gas Company were visited on Saturday, March 24, by the Foremen's Mutual Benefit Society; and in commemoration of the event the publicity department of the Company issued an effective brochure describing the undertaking and the Company's history. Gas was first turned on in Luton in 1834. The Company has gone on from success to success; and for years their gas has been among the cheapest in the South of England. Their record is revealed by the following statistics of gas made: 1868, 36 million c.ft.; 1878, 72 millions; 1888, 128 millions; 1898, 207 millions; 1908, 360 millions; 1918, 634 millions; 1927, 738 millions. Last year the number of consumers increased by 1037, and the total now supplied is 18,162, while the gas cookers in use exceed 15,500. The Company's plant is capable of producing 3 million c.ft. of gas per day. Coal, amounting to 52,000 tons per annum, is received on the Company's siding, and is emptied into pits by hydraulic rams, and then picked up by means of an electric grab travelling on a rail—the latest mechanical addition to the plant—and deposited in the coal stores at the rate of 30 tons an hour. There is, in addition to the other plant, a small carburetted water gas plant capable of producing 350,000 c.ft. per day. Sulphate of ammonia is obtained from plant capable of producing 3 tons per 24 hours. Gas is supplied to consumers through 64 miles of mains. The visitors were welcomed by Mr. N. S. Smith (Sales Manager), who apologized for the unavoidable absence of the Engineer and General Manager (Mr. W. Phillips); and the parties were in charge of Mr. J. Simpson (Chief Draughtsman) and Mr. J. H. Wright (Works Superintendent).

Gas Manufacture at Bradford.—In a report to the Bradford Corporation Committee on gas making, Mr. Ernest J. Sutcliffe (the Gas Engineer) states that gas can be made cheaper at Birkshall and Thornton Road than at the Valley Works; and a recommendation is made that the Valley Works be closed about Easter. The report explains how the displaced men would be found work. The expenses of the Gas Department will, if the report is approved, be reduced by at least £100 net per week for six months of the year.

Co-Partnership at Liverpool.—A substantial increase in bonus under the Liverpool Gas Company's co-partnership scheme was announced by the CHAIRMAN (Mr. H. Wade Deacon), when the co-partners held their second annual concert, in the Central Hall. During the last few years, said Mr. Deacon, the Directors had paid a co-partnership bonus of 4 p.ct. on the standard wage. The Board now proposed that the bonus, from Jan. 1 last, should be 5¼ p.ct. The Directors were glad to be able to give this extra bonus, and hoped it would be an inducement for all to go on pulling together.

Address on Gas at Newcastle.—An interesting address on the importance of gas was given to the members of the Newcastle Advertising Club by Mr. A. B. Roxburgh, of the Newcastle and Gateshead Gas Company. Mr. Roxburgh said that it was about 125 years since gas became commercially utilized, but there was not the slightest trace of senile decay about it; on the contrary, it was becoming more valuable to the community every year. The consumption in England, Wales, and Scotland had grown from 181,000 million c.ft. in 1907 to 304,000 million in 1927. There was every reason to believe that gas undertakings would go on from strength to strength.

Gas Lectures at Oswaldtwistle and Bolton.—At a meeting organized by the Oswaldtwistle Co-Operative Society on March 14, Mr. A. F. Ames, the Gas Engineer, spoke on "Gas and Its Uses." He described the methods of production, and said it was the cheapest medium for heating and lighting. Mr. W. J. Smith, Bolton's Gas Engineer, stated, in an address on March 15, that it was in 1818 that the town first obtained a supply of gas from the Great Bolton Gas Light Company, the population then being 28,000. From 1818 to 1872 the sale of gas in Bolton increased to 304 million c.ft., and in the latter year the Corporation acquired control at a cost of £394,688. Last year the output was 1343 million c.ft. In all, £672,000 had been voted from the Gas Department to the rates. The consumers numbered 53,640, and there were 7484 public gas lamps, and 352 miles of mains. There were also in use 15,000 cookers, 8000 gas fires, 15,000 gas boilers, 30,000 gas grillers, and 300 gas engines. The total works expenditure since acquirement from the old Company was £932,565, and the present outstanding loan debt was £605,891; £326,674 having been repaid.

[News Items continued on p. 818.]

STOCK MARKET REPORT.

LAST week on the Stock Exchange was distinguished by a record settlement; and it would appear from the animated dealings which continued at the end of the week in the Industrial section that there is every prospect that the record will be short lived. Quieter conditions existed, however, in other sections. At the beginning of the week British Funds were dull, but, with the stimulus derived from the low Treasury Bill rate, brightened towards the close. A large batch of new issues appeared at the week-end, the most important being the £1,000,000 7 p.ct. Sterling Mortgage Bonds of the Mortgage Bank of Bogota at 92½ p.ct., which is rather attractive. Home Rails continued to be neglected, and Rubbers were still under a cloud; but Oils at last showed a brighter appearance, particularly Mexican Eagles and Royal Dutch shares.

The Gas Market was quite active. Transactions were more numerous, and there were plenty of buyers. A remarkable rise of 6 points took place in the North Middlesex 6 p.ct. consolidated, which is now quoted 97-100 on a £6 18s. p.ct. dividend, though there were no transactions recorded during the week. British ordinary were marked down 1 point only for *ex* div. on a 7 p.ct. p.a. dividend, which clearly indicates an improved value. Overseas companies' shares were prominent. Bombay ordinary were dealt in at 23s. 3d. (dividend 8 p.ct.); Hong Kong and China at 14-14 3/32 (dividend 10 p.ct. f.o.t.); Oriental at 116½ (dividend 8 p.ct. p.a.); Malta and Mediterranean at 5⅝-5⅝ (dividend 7½ p.ct. for the year f.o.t.); and Montevideo stock at 93 (dividend 6 p.ct. for the year f.o.t.). Satisfactory accounts were published during the week by the Alliance and Dublin Company, and a 7 p.ct. (same) dividend recommended. The stock is very attractive at 95-99 *cum* div.

The following transactions were recorded during the week:

On Monday, Alliance and Dublin 97, Bournemouth "B" 12¼, British Gas Light 115, 116, Cardiff 7½ p.ct. debenture 103, Continental Union 28, 28⅛, Croydon sliding-scale 107¼, maximum dividend 83, European 8 3/32, 8⅛, Gas Light and Coke 18s. 6d., 18s. 9d., 3½ p.ct. maximum 63, 4 p.ct. preference 78½, Hornsey 3½ p.ct. 80½, Imperial Continental 151½, 152½, Malta and Mediterranean 5⅜, 5⅝, Montevideo 93, Newcastle and Gateshead 4 p.ct. preference 66, 3½ p.ct. debenture 65, Primitiva 21s., 21s. 1½d., 21s. 3d., 21s. 4½d., South Metropolitan 105, 3 p.ct. debenture 60, Tottenham "B" 93. Supplementary prices, Barnet 4 p.ct. debenture 76, Bath 88, Metropolitan (of Melbourne) 9⅜.

On Tuesday, Alliance and Dublin 97, 97⅝, Bombay 23s. 3d., Bournemouth 7 p.ct. 12¼, 12⅜, Commercial 99, European 8⅛, 8 1/16, Gas Light and Coke 18s. 6d., 18s. 6 3/4d., 18s. 7½d., 18s. 9d., 4 p.ct. preference 79, 3 p.ct. debenture 61, 5 p.ct. debenture 100⅜, Hong Kong and China 14, 14 3/32, Imperial Continental 153, Primitiva 20s. 10½d., 21s., 21s. 1½d., 21s. 3d., 21s. 4½d., South Metropolitan 104¾, 105⅛, 105½, 6⅛ p.ct. debenture 100⅛. Supplementary prices, Hampton Court 5 p.ct. consolidated 102½, Liverpool 5 p.ct. 88½, Wandsworth 5 p.ct. debenture 98⅜, 99, 99¼.

On Wednesday, Alliance and Dublin 97½, 97⅝, Bournemouth 7 p.ct. 12¼, 12 7/16, Commercial 98¾, 99½, 3 p.ct. debenture 59, Gas Light and Coke 18s. 6d., 18s. 6¾d., 18s. 9d., 4 p.ct. preference 78, 78¼, Imperial Continental 152, Primitiva 21s., 21s. 1½d., 21s. 3d., 21s. 4½d., 4 p.ct. debenture (1911) 75, South Metropolitan 104¾, 105, 105¼, 105½, 3 p.ct. debenture 60⅜, Tottenham "B" 93, Wandsworth "C" 100, new ordinary 100. Supplementary prices, British, Hull, 3½ p.ct. debentures 63⅜, Canterbury "B" 150, Hampton Court 5 p.ct. consolidated 103, Walton-on-Thames and Weybridge "A" 14¼, Wandsworth 5 p.ct. debenture 99¼.

On Thursday, Alliance and Dublin 98, British 116 *ex* div., European 8 1/16 *ex* div., Gas Light and Coke 18s. 6d., 18s. 9d., 3½ p.ct. maximum 64, 3 p.ct. debenture 60⅜, 61, Imperial Continental 152, 152½, 153, Oriental 116½, Primitiva 21s., 21s. 3d., South Metropolitan 104½, 105, 105¼, 3 p.ct. debenture 60, 60½, 61, 6½ p.ct. debenture 101, South Suburban 5 p.ct. debenture 95½, 96. Supplementary prices, Wandsworth 5 p.ct. debenture 99¼.

On Friday, Aldershot "C" 73, 74, Bournemouth 5 p.ct. 13, £13 4s. 3d., Cape Town 4½ p.ct. preference 6⅞, European 8⅜, 8 1/16, 8⅜, Gas Light and Coke 18s. 6d., 18s. 7½d., 18s. 8¼d., 18s. 9d., 3½ p.ct. maximum 63½, 4 p.ct. preference 78, 3 p.ct. debenture 60⅜, Imperial Continental 152½, 154, Primitiva 21s., 21s. 3d., 4 p.ct. debenture (1911) 75, South Metropolitan 104½, South Suburban 5 p.ct. debenture 95, 95½, 96, Tottenham "B" 95, 4 p.ct. debenture 76½, Wandsworth "C" 100½, new 100½. Supplementary prices, Folkestone 74½, Gas Light and Coke 7⅛ p.ct. Ilford debenture 102⅜, Preston 7 p.ct. "B" 103, Wandsworth 5 p.ct. debenture 99, 99¼.

On the Foreign Exchange Market the New York rate was firmer, closing at 4.88⅛, very little below the highest point reached in December. Dutch florins declined to 12.11 1/16; but German marks moved in favour of sterling at 20.41¼. Belgas finished at 35.00½; French francs continued at 124; and Italian lire at 92 3/16. Pesetas were quoted at 29.03-29.08.

The Bank Rate is 4½ p.ct., to which it was reduced from 5 p.ct. on April 21. Bankers' deposit rates are 2½ p.ct. The deposit rates of the discount houses are 2⅛ p.ct. at call and 2⅜ p.ct. at notice.

Issue.	Share.	When ex-Dividend.	Dividends, Prev. Hf.Yr	Dividends, Last Hf. Yr.	NAME.	Quotations. Mar. 23.	Rise or Fall on Week.	Transaction Lowest and Highest Prices.
£			%p.a	% p.a.				
171,978	Stk.	Feb 9	5	5	Aldershot 5 p.c. max. C. .	70—75	..	73—74
412,992	,,	,,	4	4	Do. 4 p.c. Pref. . .	69—72	..	..
1,551,868	,,	Sept. 29	7	7	Alliance & Dublin Ord. .	95—99	..	97—98
274,000	,,	Jan. 12	4	4	Do. 4 p.c. Deb. . .	64—67	..	..
593,654	,,	Mar. 8	7	7	Barnet Ord. 7 p.c. . . .	109—112	..	..
800,000	1	Oct. 13	1/7½	1/7½	Bombay, Ltd.	22/—24/-	+-/6	23/3
170,000	10	Mar. 8	8½	8½	Bournemouth 5 p.c. . . .	12½—13½	..	13—£13 4/3
500,050	10	,,	7	7	Do. B 7 p.c. . .	12—12½	..	12¼—12 5/8
375,000	10	,,	6	6	Do. Pref. 6 p.c. .	10½—11	..	..
50,000	Stk.	Jan. 12	3	3	Do. 3 p.c. Deb. .	56—59	..	..
163,025	,,	,,	4	4	Do. 4 p.c. Deb. .	76—79	..	..
367,900	,,	Mar. 8	7½	7½	Brighton & Hove 6 p.c. Con.	115—118	..	..
341,880	,,	,,	6/8/6⅔	6⅔	Do. 5 p.c. Con.	103—106	..	..
1,927,500	,,	Feb. 23	5	5	Bristol 5 p.c. max. . . .	88—89a	..	..
855,000	,,	Mar. 22	8	7	British Ord.	112—115*	—1	115—116
100,000	,,	Dec. 22	7	7	Do. 7 p.c. Pref. . .	114—117	..	..
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. .	72—75	..	..
200,000	,,	,,	—	83/2	Do. 5 p.c. Red. Deb. .	93—96	..	..
100,000	10	Nov. 24	8	6	Cape Town, Ltd. . . .	8—9	..	..
100,000	10	Oct. 27	4½	4½	Do. 4½ p.c. Pref. . .	6½—7½	..	6½
150,000	Stk.	Dec. 22	4½	4½	Do. 4½ p.c. Deb. . .	72—77	..	..
266,866	,,	Feb. 23	6	6	Cardiff Con. Ord. . . .	98—101	..	..
237,860	,,	Jan. 12	7½	7½	Do. 7½ p.c. Red. Deb. .	101—104	..	103
157,150	,,	Feb. 23	5	6½	Chester 5 p.c. Ord. . . .	86—91b	..	..
79,185	1	Oct. 13	†2/-	†2/-	Colombo Ltd. Ord. . . .	31/—33/-	..	..
94,495	1	,,	1/4½	1/4½	Do. 7 p.c. Pref. .	20/—22/-	..	..
375,402	1	Oct. 13	1/9½	1/9½	Colonial Gas Assn. Ld. Ord.	24/—26/-	..	..
187,842	1	,,	1/7½	1/7½	Do. 8 p.c. Pref.	21/—23/-	..	..
3,073,280	Stk.	Feb. 9	5	7	Commercial Ord. . . .	97—100	..	98¾—99
475,000	,,	Dec. 22	8	8	Do 8 p.c. Deb. .	57—60	..	59
800,000	,,	Sept. 29	‡1	‡1	Continental Union, Ltd. .	28—33	..	28—28¼
300,000	,,	Mar. 8	7	7	Do. 7 p.c. Pref. .	88—93	..	..
127,560	,,	Mar. 8	6½	7	Croydon sliding scale . .	105—108	..	107½
408,100	,,	,,	5	5	Do. max. div. . . .	81—84	..	83
492,270	,,	Mar. 8	7	10	Derby Con.	110—115e	..	..
55,000	,,	Dec. 22	4	4	Do. Deb.	71—73e	..	..
209,000	,,	Mar. 8	5	5	East Hull Ord. 5 p.c. . .	76—79	..	..
50,000	,,	Dec. 22	5	5	Eastbourne 5 p.c. Deb. .	90—95	..	..
1,002,180	10	Sept. 29	‡3	‡4	European, Ltd.	8—9	..	8⅜—8⅝
13,703,480	Stk.	Feb. 9	5	5/1/4	Gas Light & Coke 4 p.c. Ord.	18/6—19/-f	..	18/6—18/9
2,500,000	,,	,,	8½	8½	Do. 8½ p.c. max. . . .	62—64	..	63—64
4,167,020	,,	,,	4	4	Do. 4 p.c. Con. Pref. .	77—80	..	78—79
5,603,630	,,	Dec. 22	8	8	Do. 8 p.c. Con. Deb. .	60—63	..	60⅜—61
181,315	,,	,,	6	6	Do. 6 p.c. Br'tf'd Rd. Db.	102—105	..	..
1,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. .	99—101	..	100⅜
43,000	,,	—	7½	7½	Do. 7½ p.c. Ilford Deb. .	..	..	..
82,500	,,	Mar. 8	6⅜	6⅜	Hastings & St L. 5 p.c. Conv	87—90	..	..
268,740	,,	,,	5⅜	5⅜	Do. 8½ p.c. Conv.	68—71	..	80½
70,000	10	Oct. 13	†10	†10	Hongkong & China, Ltd. .	13½—14½	+1	14—14 3/32
173,300	Stk.	Mar. 8	5	5	Hornsey Con. 3½ p.c. .	78—81	..	80½
1,976,000	,,	Nov. 10	10	10	Imperial Continental Cap.	150—154	..	151½—154
223,180	,,	Feb. 9	8½	8½	Do. 8½ p.c. Red. Deb.	68—70	..	..
235,243	,,	Mar. 8	7	7	Lea Bridge 6 p.c. Ord. . .	94—97	..	..
2,145,907	,,	Feb. 23	5½	5½	Liverpool 5 p.c. Ord. . .	87½—88½b	..	..
600,000	,,	Mar 22	7	7	Do. 7 p.c. Red. Pref.	101½—103½b	* —2½	..
185,786	,,	Feb. 23	9	8	Maidstone 5 p.c. Cap. . .	108—111	..	..
75,000	5	Dec. 22	†7	†8	Malta & Mediterranean .	5½—6	+¼	5⅝—5⅞
641,930	Stk.	Nov. 24	†7	†5	Montevideo, Ltd. . . .	92—94	..	93
2,051,315	,,	Mar. 8	5	5	Newcastle & Gateshead Con.	16/8—16/9df	..	..
860,929	,,	,,	4	4	Do. 4 p.c. Pref. .	66½—67½d	..	..
691,705	,,	June 29	3½	3½	Do. 3½ p.c. Deb. .	66½—67½d	..	..
131,780	,,	Mar. 8	6/18/0	6/18/0	North Middlesex 6 p.c. Con.	97—100	+6	..
800,000	,,	Nov. 24	7	9	Oriental, Ltd.	116—121	..	116½
188,120	,,	Dec. 22	7⅜	7⅞	Plym'th & Ston'house 5 p.c.	102—107	..	..
414,500	,,	Feb. 23	7⅛	7⅜	Portsm'thCon.Stk.4p.c.Std.	101—104	..	..
338,732	,,	,,	5	5	Do. 5 p.c. max.	77—80	..	..
3,331,464	1	—	—	—	Primitiva Ord.	20/9—21/9	+-/3	20/10½—21/4½
247,500	100	Dec. 1	4	4	Do. 4 p.c. Red. Deb. .	92—95	..	..
695,000	Stk.	Jan. 26	4	4	Do. 4 p.c. Red. Deb. 1911	74—76	..	75
423,183	,,	Dec. 22	4	4	Do. 4 p.c. Cons. Deb. .	74—76	..	..
150,000	10	Mar. 22	6	6	San Paulo 6 p.c. Pref. . .	8—8½*	—½	..
195,000	50	Jan. 3	5	5	Do. 5 p.c. Red. Deb.	46—48	..	..
270,000	Stk.	Sept. 8	5⅜	5⅜	Sheffield A	102—104e	..	..
419,968	,,	,,	5⅜	5⅜	Do. B	102—104e	..	..
1,047,000	,,	,,	5⅜	5⅜	Do. C	102—104e	..	..
90,000	10	May 26	4	6	South African	4—6	..	..
5,639,895	Stk.	Feb. 23	5	7½	South Met. Ord.	104—106	+½	104½—105½
500,000	,,	,,	—	6	Do. 6 p.c. Irred. Pf.	108—111	..	..
1,895,445	,,	Jan. 12	8	8	Do. 8 p.c. Deb. . .	59—62	..	60—61
784,000	,,	Mar. 8	6½	6½	Do. 6½ p.c. Red. Db.	99—101	..	100½—101
91,500	,,	Feb. 23	8½	8½	South Shields Con. . . .	110—112 d	..	..
1,243,795	,,	Feb. 23	6½	6½	South Suburban Ord. 5 p.c.	104—107	..	..
868,887	,,	Dec. 22	5	5	Do. 5 p.c. Deb.	93—96	..	95—96
647,740	,,	Mar. 24	5	5	South'mpton Ord. 5 p.c.max.	77—79*	—2½	..
121,275	,,	Dec. 22	4	4	Do. 4 p.c. Deb.	72—75	..	..
260,000	,,	Mar. 8	7	7	Swansea 7 p.c. Red. Pref. .	100—103	..	..
300,000	,,	Dec. 22	6½	6½	Do. 6½ p.c. Red. Deb.	99—102	..	..
120,000	,,	Feb. 23	7⅜	7⅜	Tottenham District A 5 p.c.	110—115	..	..
282,275	,,	,,	6½	6½	Do. B 3½ p.c.	92—95	..	93—95
150,000	,,	,,	5½	5½	Do. 5½ p.c. Pref.	95—98	..	..
181,255	,,	Dec. 8	4	4	Do. 4 p.c. Deb.	74—77	..	76½
238,251	,,	Mar. 8	5	5	Tynemouth Con. and New Uxbridge, Maidenhead, & Wycombe 5 p.c. . . .	78—80d	+1	..
289,094	,,	Mar. 8	6½	6 3/16	Do. 5 p.c. pref. . .	87—90	..	..
88,330	,,	,,	5	5	Wandsworth, Wimbledon, and Epsom—	83—88	..	..
30,000	,,	Mar. 8	8½	8½	Wandsworth A 5 p.c. .	129—134	..	..
265,686	,,	,,	7	7	Do. B 3½ p.c. .	111—116	..	..
433,535	,,	,,	5/12/0	5/12/0	Do. C and New	98—103	..	100—100½
359,000	,,	,,	6⅜	6⅜	Do. Wimbledon 5 p.c. .	106—111	..	..
98,000	,,	,,	7⅛	7⅛	Do. Epsom 5 p.c. . . .	112—117	..	..
200,000	,,	,,	5	5	Do. 5 p.c. Pref . . .	86—91	..	..
88,416	,,	Dec. 22	8	8	Do. 8 p.c. Deb. . . .	57—60	..	..
284,743	,,	,,	4	4	Do. 4 p.c. Deb. . . .	76—79	..	..

Quotations at:—a.—Bristol. b.—Liverpool. e.—Nottingham. d.—Newcastle e.—Sheffield. f.—The quotation is per £1 of Stock. * Ex. div. † Paid free of income-tax. ‡ For year.

Nottingham's Street Lighting.

A recent pronouncement by Sir Albert Ball (the Chairman of the Nottingham Corporation Gas Committee) has led to a lively controversy in that city regarding the relative values of gas and electricity for street lighting purposes. It had been suggested that Nottingham was far behind other large towns, in that no adequate use was made of electricity for street illumination, and that such lighting could be effected at a cheaper rate by electricity than by gas—this contention being based upon certain figures in the municipal accounts. But Sir Albert, in the course of an interview, has argued that, while he is not antagonistic to the use of electricity, the figures which had been brought under consideration were inclined to give a wrong impression. Our local correspondent, referring to the discussion, writes: "While the controversy has engendered a great deal of acrimonious criticism, present conditions as to street lighting in Nottingham scarcely warrant the sweeping strictures in which one of the correspondents has indulged. Improvements of inestimable value have been effected within recent years in the illumination of the city's central thoroughfares. At the same time, it would be idle to deny that much remains to be done in many of the outlying districts, where the old street lanterns serve but to make darkness visible. Undeniably one of the best lighted thoroughfares in the city is Derby Road, a main avenue of traffic where electric lamps are in use swung across the road. The fault hitherto has been the failure to adopt for general use a standard type of street gas lamp. There is no inherent difficulty on the part of the responsible Committee in supplying the best gas possible for street illumination, as for other purposes; but as long as present archaic street appliances are allowed to remain largely in use, the possibility of effective results must of necessity be seriously discounted."

New Showrooms for Chester.—The Chester United Gas Company have purchased the premises known as Chester House, Northgate Street, and are having plans prepared for the adaption of the premises to first-class showrooms.

Issue of Stock at Bristol.—The Directors of the Bristol Gas Company have decided to issue £250,000 5 p.ct. new debenture stock at £96 10s. p.ct., and are prepared to receive applications for amounts of £10 and upwards. The subscription list opens on March 27, and closes on or before March 30.

Portsmouth Gas Company's Social and Athletic Club.—At the fourteenth annual meeting of the Club (Mr. A. J. Garward presiding) satisfactory reports were received on the activities of the various sections of the Club, and a balance-sheet was presented and adopted showing a credit balance of £265. The champion athlete's cup was presented by the President, Mr. T. Carmichael, to Mr. Cresswell, the winner for 1927, together with the inter-departmental rifle shield, won by the office team. Mr. Carmichael also handed to the Chairman two silver cups presented by Mr. T. H. F. Lapthorn, J.P., the Chairman of the Company.

Discounts to the Larger Consumers.—A proposal to allow a 15 p.ct. discount to users of over 25,000 c.ft. of gas a quarter was passed by Stockton Town Council, in spite of strong opposition from the Labour members. Mr. Allison said that the cost would be £2100, which he contended would have to be paid by the small consumer. The Chairman of the Gas Committee (Mr. T. Wilkinson) argued that this idea was fallacious. Differential prices had proved a paying proposition with other undertakings. If the gas-works were entirely dependent upon the small consumer, the price of gas would be in the neighbourhood of 4s., instead of 3s.

Field for Large Gas Engines.—Speaking at the annual meeting of the National Gas Engine Company, Ltd., Sir Dugald Clerk, F.R.S., K.B.E., mentioned their large contract for crankless engines for Australian gas companies. Substantial progress, he said, had been made in developing them, and his opinion of this type was favourable. He observed that a demand was springing up for engines to run on coke-oven gas. Formerly this field was difficult, because of the high flame temperature developed. In recent engines, this difficulty had been overcome, and a six-cylinder engine of the new type was described recently by Prof. Douglas Hay. This engine gave 500 H.P. with a brake thermal efficiency of 32 p.ct., and a total thermal efficiency from coke-oven gas to electric current of 27·8 p.ct. (the best result obtained from a large central station with steam turbines was obtained in a Manchester station, and it was 20·3 p.ct.) running with a reliability equal to that of a steam turbine, The engine had been in operation at a Sheffield colliery for three years. A 600 H.P. engine was installed eighteen years ago at the same works, and was still in successful daily operation. There was a considerable field for such engines up to about 1200 H.P.

Earl Shilton Gas-Works Purchase.—The agreement between the Hinckley Urban District Council and the Earl Shilton Gas Light and Coke Company, Ltd., with reference to the purchase of the Company's undertaking by the Council, states that the Council are to pay £20,000 for the scheduled freehold land, works, plant, and physical assets of the Company, including all mains, meters, cookers, and any other gas apparatus in use, tools, &c. Nothing shall be paid by the Council to the Company in respect of the Company's costs of obtaining their Special Order and opposing the Council's Order, or in respect of the Company's costs of the transfer of the undertaking and the winding-up of the Company, or in respect of compensation to Directors and Auditors and other officials of the Company. The Council are to take over the Manager of the Company under the terms of his existing agreement. The sale and purchase of the undertaking (on March 31) were subject to satisfactory prices being inserted by the Board of Trade in the Hinckley Gas Order. Submitting the statement at the meeting of the Hinckley Urban District Council, Mr. Burton (the Chairman of the Gas Committee) said they had had interviews with the Gas Administrator at the Board of Trade; and he believed they would have satisfactory prices given them.

Cheaper Gas at Hinckley.—At a recent meeting of the Hinckley Urban District Council, Mr. Burton (the Chairman of the Gas Committee) reported that it had been decided to make a reduction in the price of gas. All gas, with the exception of that supplied for heating and engines, is to be reduced by 2d. per 1000 c.ft. (from 3s. 4d. to 3s. 2d.); gas used for engines is to be reduced from 2s. 9d. to 2s. 6d.; and for heating, from 3s. to 2s. 11d. Gas for industrial purposes will be charged at 2s. 9d. per 1000 c.ft. The prices at Burbage are to be 5d. per 1000 c.ft. above these prices. The reduction will take effect after the reading of the meters for the current quarter.

Co-Partnership at Chester.—Continued success of the Chester United Gas Company's co-partnership scheme was reported at the annual meeting, which was presided over by Sir John M. Frost. Among the interesting figures given in the annual report was the statement that the amount allocated by the Directors to the co-partnership fund was £1394, which allowed the distribution of a bonus of 6¼ p.ct. to co-partner employees, as in former years. The number of employees participating in the scheme had again gone up, and now stood at 142. During the year £950 ordinary stock had been purchased by co-partner employees from the trustees, and there were now 111 employees holding the Company's stock.

Auckland Gas Company, Ltd.—The annual meeting of the Company was held on Feb. 6—Mr. J. H. UPTON (Chairman) presiding. In moving the adoption of the report and statements of account, the Chairman said that the sales of gas showed a decrease of 0·5 p.ct. He drew attention to the inequitable incidence of the income-tax, whereby their active rivals, the Auckland Electricity Power Board, were exempted, while the Gas Company paid £17,500. It was that hateful thing, a differential tax, only found in half-civilized countries. A dividend was declared for the past half-year at the rate of 8 p.ct. per annum, and the sum of £40,296 was carried forward.

Grays and Tilbury Gas Company.—For the fifth year in succession the staff and employees of the Grays and Tilbury Gas Company were entertained by the Directors at a social evening held at the Bridge Road Schools on Saturday, March 17, when over three hundred employees and their friends were present. Mr. Wm. F. Whittaker (Secretary), on behalf of the Directors, extended to the guests a cordial welcome, and apologized for the absence of Mr. A. W. Sumner, the Engineer and Manager. Mr. Whittaker assured the employees that the Board took a great interest in them. He paid a tribute to the work done in connection with that evening by the Welfare Committee and the stewards, and to Mr. Amos, the Hon. Secretary of the Welfare Association, who, in particular, had spared no effort to make the evening a success.

Combined Gas and Electricity Supply at Liskeard.—The report of the Electricity Commissioners on the inquiry recently held at Liskeard into the Gas and Electricity Company's application for a Special Order has now been received. Residents in the vicinity of the power station opposed the Order on the grounds of alleged noise and smell; and the Commissioners state that they have come to the conclusion that the objectors have considerable ground for their contention that nuisance is at present being caused by noise and smell from the Diesel sets installed in the station. They are of opinion that the Company should call in a consulting engineer to advise as to what steps can be taken to abate such nuisance, and have accordingly deferred further consideration of the application for the Special Order until they are satisfied that adequate measures are being adopted.

National Institute of Industrial Psychology.—The annual report of the Institute for the year 1927 indicates the development which has taken place in the application of psychology to industrial problems of all kinds. It is explained that the results achieved by the Institute's work for a well-known gas undertaking during the past three years have resulted in a decision by the Directors that the investigation shall be continued over a further period of five years. The investigator's previous work on improvements in the design of tools and appliances has continued with excellent results—one improvement effecting a saving in time of 47 p.ct. The working conditions in the retort and producer houses and the engine rooms have been studied from the point of view of the health, comfort, and liability to accident of the workers; and improvements in general organization and in speed of work have followed. All these changes have been highly appreciated by the workers.

The price of gas at Whitby will be reduced from 5s. to 4s. 9d. per 1000 c.ft. after the current quarter.

It was reported to the Coalville Urban Council, on Wednesday last, that the Gas Committee were making another grant to the general funds for the relief of the rates of £500, making £1000 for the year.

At the Earby Gas-Works, on March 15, Frank S. Keats was killed by a shaft. A supervising engineer with West's Gas Improvement Company, Ltd., of Miles Platting, in the installation of new plant at the gas-works, said he had mounted a ladder to make some adjustment, when his coat was caught, and he was whirled round. He received terrible injuries, both his legs being fractured.

Mr. Robert Lord, who is 76 years of age, and has been employed at the Middlesbrough Corporation Gas-Works for 63 years, is to retire as the result of the Corporation's decision that all their workmen must do so at 65. At a meeting of the Town Council, when it was decided to present him with a cheque as a mark of appreciation, Alderman Sir Joseph Calvert (Chairman of the Gas Committee) said Mr. Lord was the oldest employee of the Corporation, with the longest service. He had served them faithfully, living at the gas-works in order to be ready, as a fitter, to attend to any emergency. The cheque will be added to a sum being raised by his colleagues.